Essays in Asset Pricing Anomalies

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Part I

Introduction

Introduction and Summary of Research Results

Understanding and explaining asset prices have been a prevailing and prominent topic in the broad field of Finance and Economics. This thesis aims to shed light on important and practically relevant problems in asset pricing. More specifically, the thesis, consisting of three chapters, focuses on understanding the value premium, the media premium and the equity premium puzzle and aims to provide further explanations.

The value premium refers to the excess return of portfolios of stocks with high book-to-market values (value portfolios) over portfolios of stocks with low book-to-market values (growth portfolios). As first noted by Fama and French (1992) and later verified internationally by Fama and French (1998), the value premium is found to be consistently larger than can be explained by the incremental risk that value portfolios bear according to the Capital Asset Pricing Model (CAPM). Fama and French (1993) extend the CAPM by assuming value stocks contain an ad-hoc risk component that cannot be captured by the market. Value factor then has a positive loading in asset prices providing an additional premium. This led to a controversial research problem regarding the existence and validity of the value premium and identifying the risk factor value stocks contain. Many researchers and practitioners in finance provided evidence for the existence of the value premiums in different stock markets, different asset classes, different time periods (Chan, Hamao, and Lakonishok, 1991; Capaul, Rowley, and Sharpe, 1993; Fama and French, 2012; Asness, Moskowitz, and Pedersen, 2013). The enormous amount of evidences led to the wide acceptance for the observed asset pricing anomaly to be a robust finding, ruling out the possibility of the effect being a statistical artifact. Hence, we aim to identify the risk resulting in the value premium and explain the return premium in a rational equilibrium framework with empirical support.

The media premium refers to the excess return of portfolios of stocks with no media coverage over portfolios of stocks with high media coverage. Publicly available news announcements about firms are an essential channel for information dissemination. Every day, thousands of articles about companies are published in mass media and reach investors to help them assess the value of firms. This flow of news is potentially expected to increase the speed and degree of information dissemination to shares and hence improve informational efficiency. In an informationally efficient market, all information which is relevant for determining the firm value should however instantaneously be reflected by stock prices. Hence, according to the Efficient Market Hypothesis, it should not be possible to realize abnormal returns based on publicly available stale information. By examining whether mass media coverage affects the cross-section of stock returns in the U.S., Fang and Peress (2009) shed light on an important aspect of the relation between media news and stock markets. They find that stocks which are not covered by mass media earn significantly higher future returns than stocks that are highly covered by mass media. The effect remains after controlling for widely accepted risk factors. The resulting return premium (called media effect or no-media premium) is of an economically significant magnitude. Thus, we aim to verify the existence of this result internationally and analyze the sensitivity of the effect depending on market states.

The equity premium puzzle as discovered by Grossman and Shiller (1981) and Mehra and Prescott (1985), refers to the historical equity returns relative to riskfree rates being too large to be explained with the conventional theory of inter-temporal consumption and investment model of Lucas (1978) and Breeden (1979). In these models, the risk premium is modeled by the covariance term between stock returns and the marginal rates of substitution. The marginal rates of substitution expressed as a function of consumption growth is assumed to have non-zero correlation with the risky asset returns and the risk premium is then a function of this dependence. Calibrating the risky asset pricing equation by using consumption data results in very low covariance values requiring the model to have unrealistically high risk aversion levels to explain the high equity returns due to the smoothness of the consumption data. More precisely, Mehra and Prescott (1985) show that in order to rationalize the historical equity premiums, the (representative) CRRA utility function needs to have a risk aversion coefficient of at least around 40. However, in addition to the arguments of Mehra and Prescott (1985) regarding the risk aversion levels of individuals, various studies show that risk aversion levels of 40 are not plausible, which leads to the conclusion of the equity premium being a puzzle. In the literature, indeed the average estimate of the risk aversion coefficient is indeed shown to be very small around 1 and usually between 0 and 2.5 (Mehra and Prescott, 1985). In fact, various experimental studies confirmed this result by estimating relatively small risk aversion coefficients. For example, Barsky, Juster, Kimball, and Shapiro (1997) give a relative risk aversion coefficient of 3.22 as the average elicited value using answers to lottery type questions. This contradicts the implications of consumption-based asset pricing models, and as a consequence the large historical equity premiums are an empirical asset pricing puzzle. An extensive review of literature is provided and discussed thoroughly in Campbell (2003) and Mehra (2007). Myopic loss aversion as suggested by Benartzi and Thaler (1995) is considered as one of the explanations of the equity premium puzzle. However, their results are based on empirical moment observations without statistical support. Therefore, I aim to verify their results by using a more up-to-date data sample and identify the underlying reason that helps to explain the equity premium puzzle in this context.

This doctoral thesis entitled *Essays on Asset Pricing Anomalies* is composed of three papers addressing the important research questions raised above. Each paper is presented in a separate chapter as follows.

In the first research paper, we show that a representative agent with hyperbolic discounting can rationalize the value premium. Hyperbolic discounting and time inconsistency result on the aggregate from an economy with agents having standard but heterogenous time preferences. For this, we adopt a simple extension of a stochastic dividend growth model with hyperbolic time discounting without the intention of explaining all asset pricing phenomena. Based on the empirical evidence of the existing literature shown by (Lakonishok, Shleifer, and Vishny, 1994; Zhang, 2005; Lettau and Wachter, 2007) we make two main specifications regarding the cash-flow distributions of value and growth firms and study how these specifications leads to a value premium in relation to hyperbolic patience and risk aversion. In such an economy, low growth opportunities and higher sensitivity of cash-flows to aggregates for value firms are priced resulting in higher expected returns. Effects are amplified with differing levels of risk aversion and hyperbolic impatience. Moreover, assuming that markets are not fully integrated, we can use international data on time preferences and risk attitudes in relation to the value premiums across countries to test our hypotheses regarding the time preferences and risk aversion. Employing data from the International Test of Risk Attitudes and data of stocks from 41 countries around the world, we show empirically that patience and risk aversion are respectively negatively and positively related to the magnitude of value profits, confirming the implications of our model. Similar results hold for average stock volatility. Furthermore, we find that a country's growth opportunities proxied by the price-earnings ratio and firm size are other explanatory variables. Last, we analyze the effects of patience and risk aversion on value premiums by adjusting the value premiums with volatility. Because both empirical results show that patience and risk aversion have similar affects on value premiums and average stock volatility, we investigate whether the effects are caused by increased volatility in stock returns and hence result in higher value premiums.

In the second research paper of the thesis, we analyze the media news effects on the cross-section of stock returns in international stock markets. We build on Fang and Peress (2009) and contribute to the literature along four dimensions. By employing a new measure of mass media coverage, obtained from the Bloomberg News Trend database and a more recent and longer time period, we analyze the media effect for a larger set of U.S. stocks[1]. We verify the findings of Fang and Peress (2009) in the U.S. stock market. Moreover, we expand the analysis to an international level by analyzing the entire stock markets in 19 major European and Asia-Pacific (APAC) countries and 12 years of mass media data on more than 21′000 companies. We

[1] We consider all NYSE and NASDAQ stocks. Fang and Peress (2009) consider all NYSE plus 500 randomly selected NASDAQ stocks.

demonstrate that the media effect has considerable differences as to the magnitude and direction in other countries. Despite the effect being positive in the majority of countries[2], only seven countries (Hongkong, France, Switzerland, Spain, the Netherlands, Belgium and Austria) display positive no-media premiums that are statistically significant and economically large. Moreover, we analyze the media effect conditional on the market state. Defining the market state in a country as good/bullish (bad/bearish) when the fraction of stocks with positive returns in a month is above (below) 50%, we show that in the majority of countries with large number of listed stocks, following good market states, portfolios of stocks that are not covered by mass media yield higher returns than portfolios of stocks that are highly covered by media. Hence, there is a positive, mostly economically large no-media premium, when we condition on the market state being good. Conditional on the bad market state on the other hand, we find mostly insignificant or negative no-media premiums. Furthermore, we demonstrate that a strategy that goes long on stocks that are not covered by media and short on those highly covered by media when the market state is good, and the opposite when the market state is bad, yields a positive return premium in 16 out of 20 countries. The premiums are statistically significant, especially among the countries with the largest number of stocks listed. For these countries, the return premium is significant for holding periods up to 12 months and stable across various subgroups of stocks.

Finally, in the last research paper, I focus on one of the suggested explanations of the equity premium puzzle, namely Myopic Loss Aversion suggested by Benartzi and Thaler (1995) and revisit this explanation. It states that for a loss averse investor with annual evaluation frequency the observed equity premiums are at reasonable magnitudes. In their study the main assumptions include that a representative investor evaluates portfolios approximately annually and that he has prospect theory preferences with loss aversion. Their study uses simulations to illustrate the fact that a prospect theory agent with annual evaluation frequency finds the riskfree asset and equity approximately equally attractive given the empirical return distributions. In this study, I apply the same methodology to verify the results of Benartzi and Thaler (1995) by employing a more up to dat data sample. Moreover, by following the same methodology under the same assumptions, I examine the impact of a constant relative risk aversion concave utility function on their result. For this, I make numerical inferences on the required risk aversion values for a CRRA agent to find the risky and riskfree asset equally attractive. I find that a CRRA agent with an around 3.5 risk aversion coefficient can also explain the large returns of the risky asset relative to low returns of the riskfree asset. This shows that prospect theory does not seem to be the core of the explanation, requiring careful interpretation. After neglecting consumption risk and income effects, it seems that the puzzling nature of Equity Premiums does not arise at all. One can explain the premiums with reasonable risk aversion values independently of a particular choice of utility function, as long as the utility function has some concave regions with

[2]The effect is positive in 14 out of 20 countries.

sufficient curvature (see for example St-Amour, 2005).

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Part II

Research Papers

Heterogeneous Time Preferences, Hyperbolic Discounting and the Value Premium

Abstract

We show that a representative agent with hyperbolic discounting can rationalize the value premium. Hyperbolic discounting and time inconsistency result on the aggregate from an economy with agents having heterogenous time preferences. In such an economy, low growth opportunities and higher sensitivity of cash flows to aggregates for value firms are priced, which results in higher expected returns. Effects are amplified with differing levels of risk aversion and hyperbolic impatience. Employing data from the International Test of Risk Attitudes and data of stocks from countries around the world, we show empirically that patience is negatively related and that risk aversion is positively related to the magnitude of value profits, confirming the implications of our model. Similar results hold for average stock volatility. Furthermore, we find that country's growth opportunities proxied by the price-earnings ratio and the firm size are other explanatory variables.

KEYWORDS: value premium, international evidence, heterogenous time and risk preferences, dynamically inconsistent preferences, hyperbolic time discounting.

1 Introduction

The value premium refers to the excess return of portfolios of stocks with high book-to-market values (value portfolios) over portfolios of stocks with low book-to-market values (growth portfolios). As first noted by Fama and French (1992), the value premium is found to be consistently larger than that can be explained by the incremental risk that value portfolios bear according to the Capital Asset Pricing Model. Fama and French (1993) argue that value stocks contain an ad-hoc risk component orthogonal to the market, and this risk factor requires a higher return. Since then, this has created a highly debated research question regarding how to identify this risk factor and whether the observed phenomenon is a major mispricing in the market or a statistical artifact.

Since the seminal paper of Fama and French (1998), many researchers and practitioners in finance studied the value anomaly in different stock markets. For example, Chan, Hamao, and Lakonishok (1991) report a strong value premium in Japan, and Capaul, Rowley, and Sharpe (1993) present the first international evidence of value premiums. Fama and French (1998), in a large international study of value premiums, add supporting evidence for the existence of value premiums internationally (based on data from 1975 to 1995). Moreover, Fama and French (2012) report that the value premium exists in the four regions of North America, Europe, Japan, and Asia Pacific (based on data from 1991 to 2010). Finally, Asness, Moskowitz, and Pedersen (2013) show that value and momentum premiums exist across many regions of the world and in different asset classes. The literature provides enormous evidence for the observed return anomaly to be a robust finding, ruling out the possibility of the effect being a statistical artifact.

In the present study, we contribute to the literature in two ways. First, we identify a potential pricing mechanism which rationalizes the value premiums. More specifically, we show that heterogeneity in time preferences resulting in dynamically inconsistent time preferences and different risk aversion levels in an aggregate representative agent equilibrium model can help to explain a significant portion of large value premiums. Second we demonstrate that value premiums exist internationally in almost all major markets at different magnitudes. Assuming that markets are sufficiently separated, a country can be considered as being represented by one representative investor. Under this assumption, we can use international data on time preferences and risk attitudes of countries in relation to the value premiums to test our hypotheses in a cross-country setting. We find that cross country differences in value premiums can indeed be explained by cross-country differences in patience and risk aversion levels in addition to growth opportunities and firm size.

For this, we study a simple extension of the stochastic dividend growth model with hyperbolic time discounting without the intention to explain all asset pricing phenomena. Based on the empirical evidences of the existing literature shown by Lakonishok, Shleifer, and Vishny (1994), Zhang (2005) Lettau and Wachter (2007) we make two main specifications regarding the cash-flow distributions of value and growth firms and study how these specifications lead to a value premium in relation to hyperbolic patience and risk aversion.

First, motivated by Lakonishok, Shleifer, and Vishny (1994), we assume that expected cash-flow growth for the growth firm is strictly higher than the expected cash-flow for the value firm. Second, motivated by Zhang (2005) Lettau and Wachter (2007), we assume that the cash-flows of value firms correlate to the concurrent consumption more than the cash-flows of growth firms. We calibrate the model by employing Simulated Method of Moments and examine the relevant comparative statics numerically. We show that our calibration results lead to a significant value premium with very low CAPM-beta replicating the CAPM puzzle. We show that (hyperbolic) patience affects the expected returns of the low expected cash-flow growth firms more than the expected returns of high cash-flow growth firms. In other words, according to higher hyperbolic impatience, the high expected growth firms actualize more attractive than they are supposed to do over time. This results in higher prices for growth firms and lower expected returns despite higher cash-flows expectations. Moreover, we show that higher correlations to consumption makes the value firms less attractive, resulting in lower prices and higher expected returns. The model implies that similar effects hold for average stock volatility as well. However, we show that the effect of patience and risk aversion is preserved under risk adjusted value premiums. We show that Sharpe Ratio of value premiums decreases as the (hyperbolic) patience increases and it increases as the risk aversion increases in the same way they affect the value premiums. Additionally, we demonstrate the effects of our two parametric specifications of cash-flow distributions on the asset returns as a robustness check. We show that higher cash-flow expectations can interfere with the effect of hyperbolic patience such that, given that value premium is positive, growth opportunities also increase value premiums. Hence, our empirical analysis contains growth opportunities proxied by country price-earnings ratio. We verify that higher growth opportunities also increase the magnitudes of value premiums and do not capture the effect we attain with patience. Moreover, we demonstrate that the larger difference in correlations of value and growth firm cash flows to consumption can drive the large premiums. However, it decreases the Sharpe Ratio of the value premiums as it impacts the volatilities more strongly.

Based on the implications of our model, we hypothesize that patience decreases value premiums and risk aversion increases value premiums and the effects hold at the risk-adjusted return levels. To provide international empirical evidence for these hypotheses, we collect individual stock data for 40 countries in addition to the U.S. and present the largest panel of value premiums in these countries. We show that all countries but 5 exhibit significantly positive value premiums. Moreover, by relating risk aversion and time preference (patience) data across countries obtained from the International Test of Risk Attitudes (INTRA) to international evidence on value premiums, we show that both predictions of the model are empirically supported. The highest country-average portfolio of value premiums is found for value portfolios of countries that belong to the top quintile of risk aversion and that belong to the bottom quintile of patience countries. Additionally, in the large panel analyses, we control for many cross-country variables that can further explain the differences in value premiums. We show that patience and risk aversion remain significant, controlling for macro-economic and financial development measures, although the significance level of patience slightly decreases with the addition of macro-economic variables. Furthermore, we show that value premiums are negatively related to average firm size and are positively related to the stock market price-earnings ratio. However, we do not find significant stock market cash-flow volatility. The size effect is consistent with the findings in the literature: the smaller the firms are, the higher are the returns we observe for the value-growth portfolios.

Furthermore, we examine whether patience and risk aversion affect average stock volatility across countries. We show that patience is negatively associated and risk aversion is positively associated with average stock volatility. We perform the analysis controlling for stock market volatility to capture the potential effects caused by omitted country-specific risk factors. The coefficients of patience and risk aversion remain significant when controlling for many country-specific risk factors. To test robustness, we analyze the effects of patience and risk aversion on value premiums by adjusting the value premiums with volatility. Both empirical results show that patience and risk aversion have similar affects on value premiums and average stock volatility. Therefore we investigate whether the effects are caused by increased volatility in stock returns and hence result in higher value premiums. Panel regression results demonstrate that patience and risk aversion remain highly significant, explaining cross-country differences in the risk-adjusted value premiums.

In the existing literature, possible explanations for the value premiums focus on two factors: the extra risk that value stocks may bear relative to growth stocks and pricing errors associated with suboptimal investor behavior.

A prominent example of the risk-based explanation of the value premium is suggested by Zhang (2005), who studies an equilibrium model of firms. He shows that value firms, by nature, have large assets in place that entail higher adjustment costs during economic downturns relative to growth firms, which are characterized by growth opportunities. In good times, on the other hand, growth opportunities are riskier than large assets. However, the risk of growth opportunities in good times is lower than the risk of large assets' adjustment costs in bad times. This asymmetry in the risk can create the value premium. In an economic downturn, the demand for products decreases, which causes stock prices to fall and the book-to-market ratios of value firms to rise. Thus, holding value stocks entails that one does not receive distributed cash flows when one needs them most. In the aggregate, investors require larger equity returns on value stocks. However, major concern regarding this explanation is that the over-performance of value firms are extended to good times empirically that the under-performance of growth firms' shares is almost too consistent over time compared to the value firms' shares. Another explanation suggested by Lettau and Wachter (2007) focuses on the different durations of cash flows of value and growth stocks. In an equilibrium framework, assuming that investors fear short-term risks more than long-term risks, the study shows that value firms provide higher returns of low duration assets with higher exposure to short-term cash-flow shocks. However, risk-based explanations remain debatable as they rely on specific assumptions.

Lakonishok, Shleifer, and Vishny (1994) and Haugen and Baker (1996) present evidence against the view that differences in returns are risk-related. Lakonishok, Shleifer, and Vishny (1994) show that investors who extrapolate past earnings far into the future, following trends and overreacting to both good and bad news, tend to overinvest in growth stocks. This over-investment leaves value stocks underappreciated. A contrarian investor in such an economy benefits from value returns. Another explanation along these lines, offered by La Porta, Lakonishok, Shleifer, and Vishny (1997), is that reactions to earnings surprises explain some portion of value returns. Moreover, Rozeff and Zaman (1998) provide evidence that overreaction and insider trading drive value returns.

Explanations regarding the existence and magnitudes of value premiums remain widely debated, although several major contributions provide valuable explanations. In the present study, we model the value premium by assuming the common key characteristics regarding the cash-flow distributions of value and growth firms in a stochastic extension of a dividend-growth model with hyperbolic time preferences caused by heterogeneous time preferences and rationalize the CAPM puzzle. Moreover, we provide the largest empirical evidence in a number of countries for value premiums around the world, which allows us to deeply study and understand value premiums. Our empirical findings regarding the interactions among patience, risk aversion, and value premiums provide supporting evidence for both risk-based explanations and (seemingly suboptimal) aggregate investment behaviour with an additional feature of heterogenous time preferences in the literature in addition to explaining cross-country differences in the magnitudes of value premiums.

During the last decade, an increasing number of studies have provided empirical evidences for the effect of cultural differences on investor behavior in addition to significant effects of macro-economic and financial development variables on financial markets. For example, Stulz and Williamson (2003) find that culture, proxied by language and religion, affects differences in investor protection across countries. Chan, Covrig, and Ng (2005) show that mutual funds invest disproportionally large wealth to countries with which they are more familiar. Chui, Titman, and Wei (2010), by employing a country's individualism score suggested by Hofstede (2001) as a proxy of over-confidence and self-attribution bias, show that cross-country differences in individualism scores explain differences in the profitability of momentum returns. Although all asset pricing models employ time preference and risk aversion coefficients to study portfolio choices and risk premiums, to our knowledge, no study has provided evidence for the associations of time preferences and risk aversion with stock returns exogenously. These associations are widely accepted assumptions with no clear empirical evidence. The values for these coefficients are usually calculated by using observed risk premiums (Hansen and Singleton, 1983) or option prices (Jackwerth, 2000; Ait-Sahalia and Lo, 2000) or, for time preferences, by using household consumption-savings survey results relying on the assumptions of these associations (Lawrance, 1991; Angeletos, Laibson, Repetto, Tobacman, and Weinberg, 2001). In this study, we use an exogenous set of data to measure time preferences and risk aversions for countries, and we test their associations with value premiums and stock volatility. Our study is the first to provide empirical evidence that aggregate investor behaviors related to preferences may differ across countries, and these differences have surprisingly extensive and significant effects on stock returns and volatility.

The remainder of the paper is organized as follows: In the next section, we outline the consumption-based dividend-growth model, calibrate it to stock returns, and present its comparative statics, according to which the value premium increases with both time discounting and risk aversion. Then, we describe the international data used in the paper. Our main results are found in sections IV and V, where we show that the international data support the hypotheses derived from the dividend growth model. In the conclusion, we note potential extensions of our paper. Details that would hinder the flow of the arguments presented in the main part of the paper are relegated to appendices.

2 Model

We model the economy with an aggregate representative agent optimizing her consumption over an infinite time horizon with hyperbolic time discounting allowing dynamical inconsistency. Although this assumption may seem to contain an irrationality feature, is actually the result of a general equilibrium model with agents having standard but heterogenous time preferences. This has been shown throughly by Lengwiler (2005) and Gollier and Zeckhauser (2005). In particular, the representative investor does not anticipate the dynamic inconsistency and nor optimize her consumption accordingly. Moreover, the aggregate impatience can be represented as a monotonic function of the average impatience of all investors. Similar result holds for heterogeneity in risk preferences in the sense that in an economy with heterogeneous agents in risk aversion, the aggregate representative agent's risk aversion is equal to the wealth weighted average of risk aversion coefficients of all investors (Hens and Rieger, 2010).

In the present study, financial markets are modeled as a stochastic extension of the constant dividend-growth model (Brealey, Myers, and Allen, 2007; Gordon, 1959). In the constant dividend-growth model, the firm pays out dividends (profits), dividends grow at a constant rate, and the value of the equity is equal to the sum of discounted future profits. We extend the model by assuming that the growth of dividends/cash flows is driven by a drift, expected growth rate, plus a stochastic component, modeling random shocks to growth rates.

The (aggregate) representative agent is assumed to hyperbolically discount the future by a delta-beta function with a present bias coefficient of $0 \leq \delta \leq 1$ and a time preference coefficient $0 \leq \beta \leq 1$, and she evaluates consumption using a concave CRRA utility function: $U(C) = \frac{C^{1-\alpha}}{1-\alpha}$. Financial markets consist of two risky assets and one risk-free asset. Whereas the risk-free asset has a constant cash flow rate, the risky assets' payoffs are driven by random i.i.d.(identically and independently distributed) cash flow growth processes. The representative agent's problem is expressed as

$$\max_{\{\theta_t^0, \theta_t^1, \theta_t^2\}_t} U(C_t) + \delta \sum_{s=t+1}^{\infty} \beta^s \mathbb{E}\left[U(C_s)\right] \quad \text{s.t. for all time periods } t = 0, 1, 2, ... \tag{1}$$

$$C_t + \theta_t^0 q_t^0 + \theta_t^1 q_t^1 + \theta_t^2 q_t^2 = W_t + \theta_{t-1}^0 (q_t^0 + \pi_t^0) + \theta_{t-1}^1 (q_t^1 + \pi_t^1) + \theta_{t-1}^2 (q_t^2 + \pi_t^2)$$

$$\theta_{-1}^i = 1, \ \forall \ i = 1, 2, \ \text{and} \ \theta_{-1}^0 = 0$$

where W_t represents the exogenous wealth, $q_t^i, i = 1, 2$ represents the risky asset prices, $i = 1$ is the value firm, and $i = 2$ denotes the growth firm. $\theta_t^i, i = 1, 2$ denotes the units of the assets held in order to receive the cash flows $\pi_t^i, i = 1, 2$. Risky assets are in unit net supply, whereas the risk-free asset is in zero net supply. The risk-free asset pays a fixed cash flow at each time t that is $\pi_t^0 = (1 + g^0)$. Each firm starts with capital K^i. Its initial profit is a percentage of its capital $0 \leq a^i \leq 1$. Thus, for $i = 1, 2$, $\pi_0^i = a^i K^i$. After the initial period, cash flows π_t^i grow at a rate that is subject to normally distributed random shocks:

$$\pi_{t+\tau}^i = \prod_{\tau'=t+1}^{t+\tau} (1 + g_{\tau'}^i) \pi_t^i, \quad \text{where } g_t^i = \mu_g^i + \sigma_g^i Z_t^i, \ \text{and } Z_t^i \sim \ N(0, 1), \forall t, i. \tag{2}$$

We define the price-to-book ratio of the firm at time t as the price q_t^i divided by its initial capital invested in the firm K^i, which leads to price-to-book$_t^i = \frac{q_t^i}{K^i}$, for both firms[3].

Our aim is to study the effects of different impatience and risk aversion levels in asset returns of value and growth firms while we try to model firms' cash-flows characteristics inline with the existing empirical observations. We adopt three main characteristics: 1) A growth firm carries growth opportunities, thus expected cash-flow growth for a growth firm is higher, 2) Cash-flows of a value firm are more sensitive to shocks to the economy, 3) Volatility of value firm's cash-flows growth is not higher than volatility of growth firm's cash-flow growth.

To adopt these characteristics, we assume that $\mu_g^1 < \mu_g^2$ and $\sigma_g^1 \sim \sigma_g^2$ and an exogenous aggregate consumption process with normal random shocks and differing correlations to shocks

[3] We assume capital does not depreciate; hence, the value of the capital of the firm will be the same for all time t.

to cash-flows of value and growth firms as follows:

$$C_{t+\tau} = \prod_{\tau'=t+1}^{t+\tau} \left(1 + g_{\tau'}^{C}\right) C_t, \text{where } g_t^C = \mu^C + \sigma^C B_t, \text{ and } B_t \sim \ N(0,1), \forall t$$

and without loss of generality $corr(B_t, Z_t^1) > corr(B_t, Z_t^2)$.

The first characteristic we adopt is rather intuitive since growth opportunities bear naturally higher expected growth (for a detailed discussion refer to Lakonishok, Shleifer, and Vishny (1994)). The second characteristic can still be considered slightly debatable. However, one of the main explanations of value premium by Zhang (2005) relies on the inference of value firms having large assets and bearing higher adjustments costs during bad times relative to growth firms. During the good times on the other hand, growth firms growth opportunities bear a higher risk. The effect is asymmetric in the sense that during the bad times, value firms suffer much more than growth firms suffer during the good times. This asymmetry causes the value spread to be significant. This implies that - measuring unconditionally - value firm's cash-flows are much more sensitive to shocks to economy or consumption. Moreover, similarly Lettau and Wachter (2007) points out the fact that value firms, being more short duration assets, contain a higher cash-flow risk as cash-flows are being realized presently and continuing. To the contrary, growth firms being longer duration assets, carry a higher discount rate risk as cash-flows are more expected to realize in the future with the growth opportunities. Both observations make a valid characteristic for the difference of cash-flow distributions of value and growth firms. That is, cash-flows of value firms are more sensitive to the shocks to consumptions concurrently. Third and last is that none of the studies points out the fact that actually cash flows of value firms are more volatile than cash flows of growth firms.

The solution of this equilibrium has a rather interesting feature as it leads to dynamic inconsistency. This means that the optimal consumption path for time t at the asset prices supporting the equilibrium will not be optimal at time $t+1$. Thus the resulting realized consumption path will actually be different from the one that was found to be optimal. The argument we consider here is very similar to Strotz (1955). However, in the individual decision making mechanism considered by him, one can argue that the agent can anticipate his future behavior and try to adjust his behavior in different ways to commit to the consumption plan that is optimal at time t. In contrast, we assume dynamic hyperbolic discounting for the representative agent because an equilibrium with consistently optimizing agents having heterogenous time preferences can be represented by such an aggregate representative agent. Therefore, we model the representative agent has a hyperbolic time discount function to capture the effects of heterogeneous time preferences.

Proposition 1. *The prices of risky assets follow a constant price-earnings ratio (PE) for each* *time t and for all time $\tau > t$, the (naive) expected price $q_\tau^{i(n)}$ from time t, respectively:*

$$q_t^i = \delta m^i \pi_t^i \quad and \quad q_\tau^{i(n)} = m^i \pi_\tau^i, \ \forall \ i = 1, 2, \tag{3}$$

where dynamic inconsistency caused by the change in consumption path leads to a non-stochastic price adjustment for all time $\tau > t$: $q_\tau^i = \delta q_\tau^{i(n)} = \delta m^i \pi_\tau^i$. The multiplier m^i for the firm i is a deterministic expression and has the value:

$$m^i = \sum_{s=1}^{\infty} \beta^s \mathbb{E}\left[\frac{1+g_{\tau'}^i}{(1+g_{\tau'}^C)^\alpha}\right]^s = \frac{\beta \mathbb{E}\left[\frac{1+g_{\tau'}^i}{(1+g_{\tau'}^C)^\alpha}\right]}{1 - \beta \mathbb{E}\left[\frac{1+g_{\tau'}^i}{(1+g_{\tau'}^C)^\alpha}\right]}, \tag{4}$$

given that $\beta \mathbb{E}\left[\frac{1+g_{\tau'}^i}{(1+g_{\tau'}^C)^\alpha}\right] < 1$ holds ensuring the convergence of m^i. The expected returns of the risky assets are expressed as a function of the multiplier m^i, present bias coefficient δ and the profit growth expectations:

$$\mathbb{E}\left[R_{t+1}^i\right] = \mathbb{E}\left[\frac{q_{t+1}^i + \pi_{t+1}^i}{q_t^i}\right] = \frac{\delta m^i + 1}{\delta m^i}\mathbb{E}\left[1+g^i\right] \tag{5}$$

$$= \left(1 - \frac{1}{\delta} + \frac{1}{\delta\beta\mathbb{E}\left[\frac{1+g_{\tau'}^i}{(1+g_{\tau'}^C)^\alpha}\right]}\right)\left[1+\mu_g^i\right]. \tag{6}$$

For the proof, refer to the Appendix.

In this economic model, we achieve a rather simple asset pricing expression, which implies a non-stochastic Price-Earnings, (or price-dividend) ratio $q_t^i/\pi_t^i = \delta m^i$ that is determined by a firm's cash flow growth dynamics and its interaction with future consumption growth dynamics for an investor with risk aversion α and hyperbolic time discount coefficients of $\delta - \beta$ model[4]. The effect of β is a linear level effect, causing returns and volatilities to be higher for all assets in the same way. This cannot affect the cross-section of stock returns, hence we find β as an irrelevant variable in this context and we focus on the interaction between coefficients of risk aversion α and hyperbolic impatience δ and asset returns. The effect of risk aversion coefficient has the standard intuition of consumption based asset pricing. Higher correlation to consumption leads to the asset to pay lower when the consumption is low and payoff is more valuable, which leads to lower prices and higher returns for this asset. This is then expected to explain some portion of larger returns of value firms relative to returns of growth firms. However, this feature alone is not able to explain the low returns of growth firms having higher expected cash-flow growth.

[4]A special case of the model results in the constant dividend-growth model by Gordon (1959). Details are presented in the Appendix.

In asset pricing, expected returns and expected cash-flow growth are expected to have strong positive association. However, an equilibrium of aggregate representative agent with hyperbolic time discounting leads to a price adjustment by δ in relation to expected growth systematically over time. Larger expected growth will amplify the effect of δ in prices, which causes differences in cross section of stock returns[5]. A decrease in δ leads to lower returns for higher expected cash-flow growth stocks.

In this study we aim to analyze the effects of risk aversion and heterogenous time preferences leading to hyperbolic discounting on value premiums in a rather simple model without the intention of explaining all stylized facts of stock returns. For this, we focus on the cross section of stock returns in relation to two parameters, δ and α. The expectation term in Equation 6 represents Marginal Rates of Substitution(MRS). An increase in risk aversion will decrease the value of MRS and this increases the expected returns. This effect will be larger for the firm which has higher correlation to consumption. Assuming that the two firms cash-flow dynamics may be the same, the higher correlation of cash-flows of the value firm will carry a higher return premium. However, empirical observations of cash flow growths of value and growth firms as demonstrated by Lakonishok, Shleifer, and Vishny (1994) extensively suggest that growth firms have higher growth expectations. In a standard equilibrium model, this would reduce the value premium significantly and potentially leading to no or very low value premium. Hyperbolic discounting, on the other hand, consumption allocation changes over time affects higher growth expectation relatively more and hence we find that impatience coefficient δ effects the returns of value and growth returns differently. The intuition is that the preferences to consume much more at current time t systematically over time find the larger growth in cash-flows more attractive as the larger payoff will increase the possibility of consume systematically larger over time. We present two special cases for our model in the appendix. A case in which our model reduces in to Gordon (1959) model and a case we allow for hyperbolic discounting in the standard Gordon (1959) model with no uncertainty. The effect of hyperbolic impatience coefficient on the returns of assets with differing cash-flow growth rates is illustrated. The effect results in a positive value premium even in an economy with no uncertainty, assuming that value firm has a lower cash-flow growth.

Additional feature of the price-earnings ratio in this context is that it affects the volatility of stock returns. The empirical findings of Shiller (1981) show that price movements are too large to be explained by changes in dividends. In our economic model, we partially achieve this empirical characteristic. Price-earnings ratio as a function of Marginal Rates of Substitution and

[5] When we formulate the representative agents problem by formulating the budget constraint reflecting the correct price system for all future time periods, we achieve an Euler equation of $1 = \beta\mathbb{E}\left[\frac{U'(C_{t+1})}{U'(C_t)}\frac{q^i_{t+1}+\delta\pi^i_{t+1}}{q^i_t}\right] = \beta\mathbb{E}\left[\frac{U'(C_{t+1})}{U'(C_t)}R^i_{t+1} + \frac{U'(C_{t+1})}{U'(C_t)}(\delta-1)(1+g^i)\frac{\pi^i_t}{q^i_t}\right]$. When there is no hyperbolic discounting, $\delta = 1$, Euler equation reduces in to its standard form.

hyperbolic impatience coefficient δ amplify the effect of changes in cash flows on asset prices. Equation 6 shows expected return and expected cash-flow growth dynamics. As the multiplier term is always greater than 1, this implies in this setting stock returns are expected to be more volatile than volatility of cash flows[6]. The stock return volatility is amplified by the risk aversion and impatience coefficients further in the same way they affect the stock returns.

It is important to verify that stock volatility does not increase exactly as much as the stock return increases such that it impacts the cross-section of stock returns. Because attaining explicit and neat formulas for the comparative statics for sharpe ratio for value premiums is not tractable, we do numerical computations for the comparative statics. For this, first we do the calibration of the model with Simulated Method of Moments and for the computation of the Marginal Rates of Substitution excepted value term we use Monte-Carlo Method[7].

We specify the main characteristics for cash-flow distributions based on the empirical observations and using reasonable risk-aversion and impatience coefficient values in the calibration. Our main specifications are that expected cash flow growth for the growth firm is strictly higher than the expected cash-flow growth for the value firm and that value firm's cash flows have strictly higher correlation to consumption than growth firm's cash flows. Moreover the volatility of cash flows of both firms are not different. We calibrate for the preference parameters β, δ, α and growth expectations and correlations in both firms cash flow and consumption to match the first moments of the simulated asset returns as long as the infinite series sums all converge. More specifically, for the method of moments, we use a different adaptation. Instead of using fixed values to optimize over the first moments, risk free rate and market return, we allow intervals for all of moments. The empirical values of of first moments are changing over time from time period to time period from country to country. We find it limiting the model too much optimizing to match fixed values that come from a particular time period and particular country. The intervals for each first moment we consider are as follows: $r_f \in (0.01, 0.04)$, $r_M \in (0.065, 0.10)$, $r_G > 0.055$ and $r_{VMG} > 0.04$. Calibration results and simulated model moments are presented in Table IX in the appendix.

In the calibration, to remain consistent with the literature we try to follow a stylized facts of asset prices on the first and second moments (see for a detailed survey Campbell (2003)). One perk in our model is that the smoothness of consumption growth is also an issue but to a lesser extend compared to standard models. We could achieve a reasonable equity premium of

[6] The multiplier $\left(1 - \frac{1}{\delta} + \frac{1}{\delta\beta\mathbb{E}\left[\frac{1+g^i_{\tau'}}{(1+g^C_{\tau'})^\alpha}\right]}\right) > 1$ can be seen clearly as we have $\delta < 1$ for the hyperbolic discount function and for the m^i term to converge we have to assume $\beta\mathbb{E}\left[\frac{1+g^i_{\tau'}}{(1+g^C_{\tau'})^\alpha}\right] < 1$. Under these specifications, the result is immediate.

[7] For the Monte Carlo Method, we use a fixed seed for the random number generator and 30000 sample size.

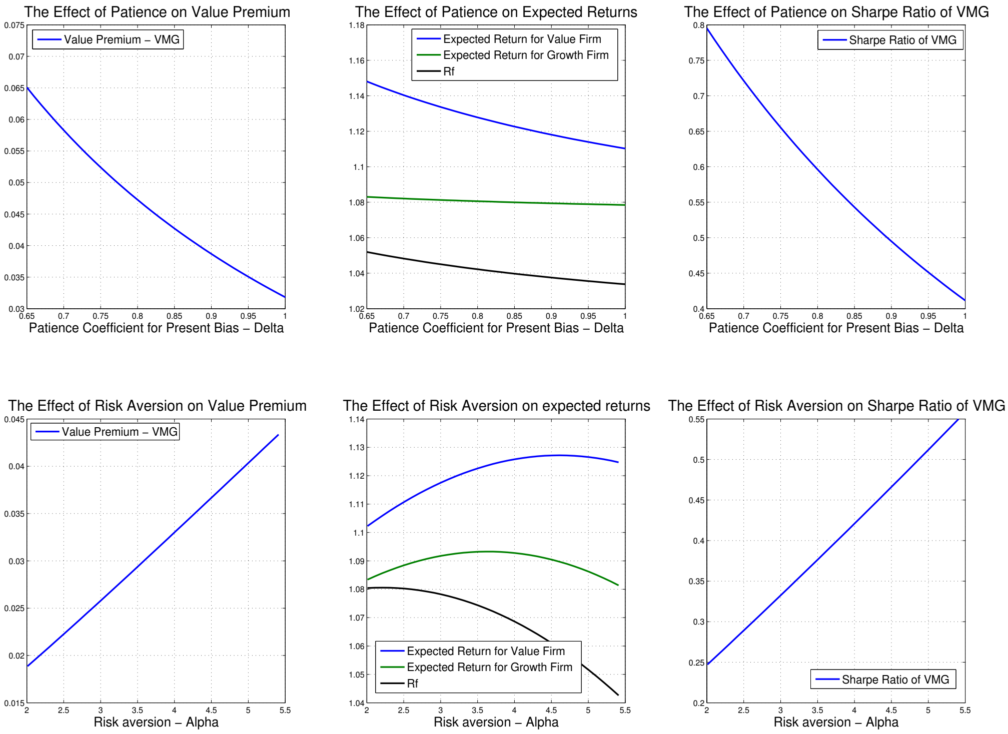
7.3% with a 20% of annual sharpe ratio by allowing the consumption volatility to be slightly higher than it is generally considered in the existing literature. As Savov (2011) shows that the issue regarding the fact that consumption data is too smooth to explain the equity premium puzzle and/or risk-free rate puzzle can be caused by the consumption data itself. Considering garbage data as a proxy for consumption, the study shows that performance of consumption based asset pricing has been improved immensely. The computed volatility of garbage depending on different inclusions of goods ranges roughly from 2% to 5%. In this study we allowed the volatility of consumption to be 7.5% to match the moments of asset prices. When we reduce the volatility to consumption, we also have equity premium puzzle or risk free rate puzzle depending on risk aversion levels, however our main focus of large value premiums remain robustly and all the comparative statics for value premiums in relation to patience and risk aversion are stable.

Calibration results show that the value premium puzzle is naturally generated in this economy. Simulating asset returns with the parameters given in Table IX in the Appendix, we see that firm 1 has a much lower Price-Earnings ratio than Firm 2 which confirms that firm 1 satisfying the observed cash-flow specifications is indeed the value firm and vice versa. Moreover, we achieve a value premium of approximately 4.3% with a Sharpe Ratio of 55%. Taking an equally weighted market portfolio of the two risky assets' returns, we can compute the covariances and the CAPM beta terms for the simulated asset returns. We find that the CAPM beta for the value stock is approximately 1.0353, whereas the CAPM beta for the growth stock is 0.9647. Forming a value minus growth portfolio, that is, going long in value and short in growth, produces a CAPM beta of 0.0705 with an expected return of 4.3%. Table IX shows that we have a 11.3% return for a beta of 1.0353 and a 7.5% return for a beta of 0.9647. The return differential is simply too large to be explained by a beta of the value minus growth portfolio that is very close to zero.

Finally, by using the calibrated values of our model, we illustrate the comparative statics with respect to hyperbolic patience coefficient δ and risk aversion coefficient α numerically in Figure 1.

Figure 1 presents the comparative statics with respect to the hyperbolic time preference coefficient δ and risk aversion coefficient α of the (aggregate) representative agent. A higher time preference coefficient implies a more patient investor and $\delta = 1$ results in no hyperbolic discounting in our setting. On the top row, Chart 1 shows that a increase in patience negatively affects the value premium. Chart 2 illustrates the effects of increasing patience on expected returns on all assets, and Chart 3 shows that increasing patience further decreases the volatility-adjusted value premiums. The second row of charts in Figure 1 depicts the comparative statics of value premiums with respect to the risk aversion coefficient α of the representative agent. Chart 4 illustrates the effect of an increase in risk aversion on the value premium. Chart 5 illustrates the effect of risk aversion on expected returns and on return for risk free asset. Finally, Chart 6 on the bottom row shows the volatility risk adjusted value premium. We find this information

Figure 1. The comparative statics of value versus growth asset returns with respect to hyperbolic patience coefficient of δ and the risk aversion coefficient α. Value Premiums are calculated as value portfolio minus growth portfolio returns (VMG). For the comparative statics with respect to δ we use $\beta = 0.95, \alpha = 5.5$ and for the comparative statics with respect to α we use $\beta = 0.95, \delta = 0.835$. We have employed a lower value of β than the calibrated value as presented in Table IX to ensure the convergence of infinite series sums for changing levels of parameters.

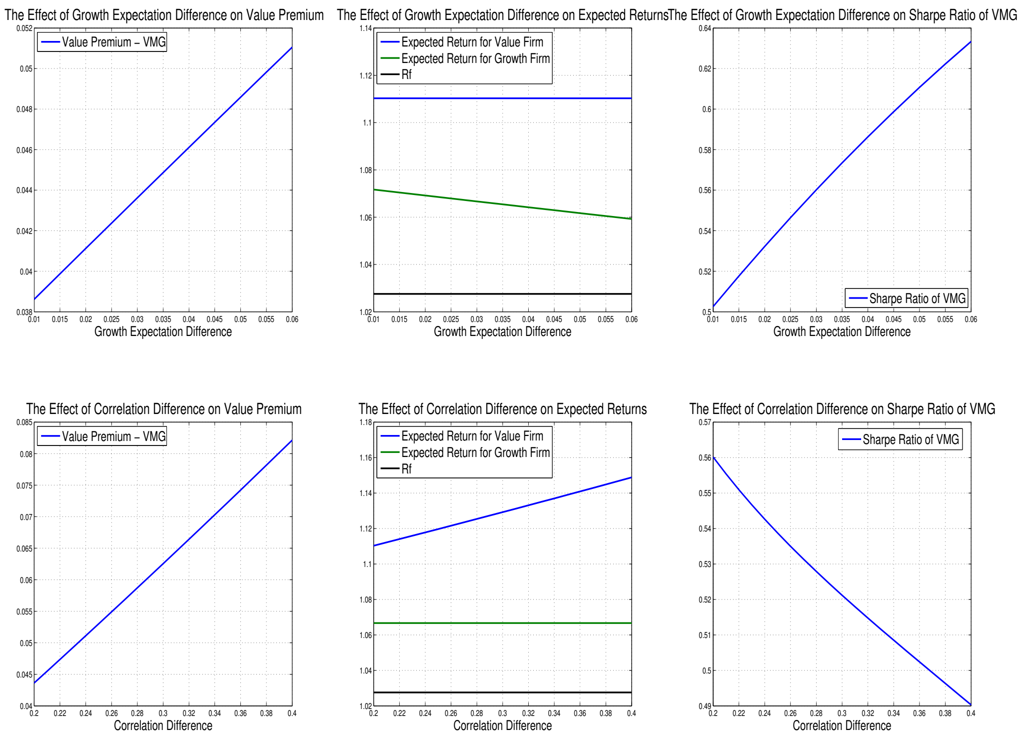


crucial to report because both the volatility and the expected returns of the value firms increase, and it is important to examine whether the higher return is associated strictly with higher risk in the returns. However, both Chart 3 and 6 on the top row and bottom row show that the increasing volatility of the value spread is not sufficiently large to explain the increasing value premium as a result of increased risk aversion or increased impatience.

In our model we make two main specifications about the cash-flow distributions of value and growth firms. It is important to understand the effect of these specifications on the main implications of our model.

First we analyze the effect of higher cash flow growth expectations. Figure 2 on the top row we demonstrate the effects of cash flow growth expectations differences. Higher cash flow expectation reduces the expected returns and leading to higher spread for the returns of value

Figure 2. The comparative statics of value versus growth asset returns, with respect to differences in correlations to consumption and difference in growth expectations. Value Premiums are calculated as value portfolio minus growth portfolio returns (VMG). For the comparative statics with respect to difference in correlations, we keep the correlation for the growth firm's cash flows at calibrated level $\rho^{2,C} = 0.35$ and put in the x-axis $\rho^{1,C} - \rho^{2,C}$. For the comparative statics with respect to difference in growth expectations, we keep expected cash-flow growth for the value firm constant at $\mu^1 = 0.04$ and put in the x-axis $\mu^2 - \mu^1$. The remaining parameters are from the calibration results as given in Table IX.



over growth firm assets, and the effect is preserved in Sharpe Ratio of Value Premium. This means that a potential difference in magnitudes of Value premiums can be caused by higher growth opportunities interacting with hyperbolic impatience δ in the general economy. This implies that a test for patience effects for value premiums should control for general growth opportunities in the economy.

Our second specification is that cash-flows of the value firms have a higher correlation to the consumption relative to the cash-flows of the growth firm. This effects the Marginal Rates of Substitution and changes the expected returns of the assets, through which the risk aversion coefficient affects the expected returns. One may argue that the differences in correlation may cause differences in magnitudes of the value premiums more than differences in risk aversion levels. Figure 2 on the bottom row we demonstrate the effects of correlation differences of cash flows between value and growth firms. Higher correlation increases the expected return of the of assets and hence increases the value premium, however, it affects the volatilities increasingly more. As the Chart 6 shows that Sharpe Ratio of the Value premiums reduces as the correlation spread between value and growth firms increases. Thus, we conclude that the risk aversion effects on value premiums cannot be caused by differences in correlations of firms to consumption.

Motivated by the model implications, in this study, we test the following hypotheses empirically by employing a large panel of stocks from countries around the world and international individual preference data provided by INTRA.

Hypothesis 1. *Value premiums decrease as the aggregate patience increases–in other words, as investors become less patient (have more willingness to wait).*

Hypothesis 2. *Value premiums increase as aggregate risk aversion increases.*

Hypothesis 3. *The average stock volatility increases with risk aversion and decreases with patience.*

Hypothesis 4. *The sensitivity of value premiums to risk aversion and patience cannot be explained by increasing stock volatility. Volatility-adjusted value premiums increase with risk aversion and decrease with patience.*

2.1 Auxiliary Assumptions on Market Globalization

To analyze international differences in stock market returns, we make two assumptions regarding the degree of stock market globalization.

The first assumption is that the composition of investors in stock markets is not homogenous across countries. Of course, every investor could invest in all countries' stock markets. The content of this assumption is that investors typically do not sufficiently diversify internationally, so the composition of investors, weighted by the amounts of wealth they invest, is more or less determined by investors from the home country. This assumption is empirically supported by the home bias literature. See, for example, Chan, Covrig, and Ng (2005), Bekaert and Harvey (1995), French and Poterba (1991), Li, Sarkar, and Wang (2003), and Bekaert and Wang (2009).

Assumption 1. We assume that the composition of investors in a country is biased toward the investments in that country; that is, investors exhibit a sufficient degree of home bias.

The second assumption is that although many companies have multiple listings across world markets, shares listed in the home market lead the price formation. This assumption is also supported by a large body of literature. See, for example, Agarwal, Liu, and Rhee (2007), Ding, deB Harris, Lau, and McInish (1999), Eun and Sabherwal (2003), Gramming, Melvin, and Schlag (2005), and Neumark, Tinsley, and Tosini (1991).

Assumption 2. Price discovery is led by the home market.

Given these two empirically supported assumptions, we believe that it is reasonable to hypothesize that international differences in investor preferences could significantly impact local stock markets.

3 Data Description and Summary Statistics

In the present study, we examine whether investors' time and risk preferences affect stock returns, in particular, the return differential between value and growth stocks. For this purpose, we use data on time and risk preferences provided by the International Test of Risk Attitudes survey (INTRA), conducted by the University of Zurich. The survey was conducted among economics students in 52 countries, with more than 7,000 university students participating in the survey. In addition to data on time and risk preferences and socio-economic characteristics of the participants[8], in each INTRA country, participants were asked to fill out a questionnaire that included questions on decision making, cultural attitudes, and the respondent's personal background Wang, Rieger, and Hens (2013). The questions were made comparable by translating them into local languages and adjusting the numbers involved into local currencies and income levels. The survey was conducted only once in each country, and no monetary incentives were provided[9].

For the present study, we focus particularly on two dimensions of the data: patience, measured as the percentage of participants willing to wait for higher returns, and risk aversion, measured as the average ratio of the compensation a participant requires for a given loss [10].

Patience is measured by a question that elicits binary responses from the individual, so the average of the answers is the percentage of the survey respondents willing to wait for a higher financial return. In the question, choosing to wait an extra month would yield approximately 10% higher returns. The stakes are adjusted so that a student would hypothetically receive an amount equivalent to the average student's monthly living costs in each country if he chooses not to wait and a 10% larger amount in a month if he chooses to wait. Table I provides the country values

[8]The countries included in INTRA are limited to Angola, Argentina, Australia, Austria, Azerbaijan, Bosnia and Herzegovina, Belgium, Canada, Chile, China, Colombia, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hong Kong, Hungary, Ireland, Israel, Italy, Japan, Lebanon, Lithuania, Luxembourg, Malaysia, Mexico, Moldova, the Netherlands, New Zealand, Nigeria, Norway, Poland, Portugal, Romania, Russia, Slovenia, South Korea, Spain, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Turkey, the United Kingdom, the US, and Vietnam.

[9]However, in Switzerland, the University of Zurich INTRA team has conducted the survey repeatedly over many years, paying participants according to their choices. Their results do not differ significantly over time or between paid and unpaid respondents.

[10]Although the degree of representativeness of the average of individual risk aversion estimates for a country may be debatable to a certain extent, we find it sufficiently convincing that in a simple model with CRRA individual utility functions, aggregation results show that the risk aversion coefficient of the representative agent can be expressed in some form of average risk aversion coefficients of individual utility functions. For more details, see, for example, Hens and Rieger (2010) and references therein.

for the patience proxy. We observe that Russia, Chile, and countries located relatively more toward the south are the least patient, whereas countries located more to the north are the most patient according to this measure. Additionally, the US and UK are among the least patient countries, which indicates that economic development has a rather small effect on patience. Patience measures the average willingness to wait for a country and may originate from many country-specific factors that may be difficult to measure or quantify but that affect the time horizon of individuals. In this study, we do not claim that the differences in patience/willingness to wait across countries originate solely from cultural differences. Moreover, patience is found to be linked to general economic development measures across countries, as shown by Wang, Rieger, and Hens (2013).

Table I Patience Proxy Across Countries

The measure is calculated as the percentage of individuals who chose to wait to realize a 10% higher financial return one month in the future. The data are calculated based on a question that elicits binary responses from respondents. Taking the average of the answers yields the percentage of survey participants who would be willing to wait. The stakes are chosen to be an average student's monthly living costs in his or her country of study.

Country	Patience	Country	Patience
Russia	0.33	Argentina	0.66
Chile	0.37	USA	0.66
Italy	0.43	Ireland	0.68
Spain	0.45	Taiwan	0.69
New Zealand	0.45	United Kingdom	0.71
Greece	0.46	South Korea	0.72
Australia	0.51	Japan	0.74
Vietnam	0.52	Hungary	0.76
Romania	0.56	Israel	0.77
Thailand	0.57	Austria	0.78
Croatia	0.58	Poland	0.78
Turkey	0.58	Canada	0.78
Mexico	0.58	Hongkong	0.79
India	0.59	Denmark	0.83
Portugal	0.59	Norway	0.84
Lithuania	0.60	Netherlands	0.85
Malaysia	0.61	Finland	0.85
Colombia	0.62	Switzerland	0.86
China	0.63	Belgium	0.86
France	0.65	Germany	0.89
		Sweden	0.89

The risk aversion values, calculated as the mean gain/loss ratio [11] of all participants within a country, is a proxy for the curvature of a representative agent's utility function. The lottery question simply asks participants to state the minimum amount of gain they would require in a lottery given that there is a 50% chance of losing $y = 100$\$, such that they would be willing to participate in the lottery for free. Their given answer, x, represents the amount at which the

[11] Since Barsky, Juster, Kimball, and Shapiro (1997), it has been known that asking for a simple gain/loss trade-off is among the most robust methods of determining an agent's degree of risk aversion. See Harrison and E.Rutstrom (2008) for a recent survey of methods of determining agents' degrees of risk aversion.

expected utility of the lottery would be equal to the utility of an agent with wealth W without participating in the lottery:

$$U(W) \sim 0.5U(W + x) + 0.5U(W - y). \tag{7}$$

In the lottery question, the loss amount, y, is constant for every individual within a country. Participants have, on average, very similar socio-economic characteristics because they are all college students in the same country. Thus, we expect that differences in wealth do not create large discrepancies. For each individual, the amount x is directly related to the curvature of his or her utility function and hence is monotonically related to the risk aversion coefficient. A more risk averse individual should rationally require, ceteris paribus, a higher x than a less risk averse individual. Therefore, the gain/loss ratio, x/y, of individuals provides a stable proxy for the risk aversion coefficient for individuals. We take the average gain/loss ratio of the sample within each country to obtain each country's proxy for average risk aversion.

Generally, survey data are known to be very noisy because questions might be misunderstood, and the incentives for respondents to provide correct answers are minimal. In this study, we attempt to apply as little data cleansing as possible and check whether the cleansing of data changes our main results. The only cleansing criterion we apply is a so-called sensibility check. Because the survey has two questions on the gain/loss ratio with relatively small differences in stakes [12], we expect the calculated ratios not to differ substantially for each individual if the answers given are sensible. For example, we eliminate individuals who require a 50$ gain in the first lottery and a $1,200$$ gain in the second lottery because this would result in a difference between the gain/loss ratios for this individual of more than 10. We checked the sensitivity of our results to such a sensibility threshold and find that our results do not change if we consider all threshold levels from 2 to 10. However, the significance of our results declines if we apply an overly generous sensibility threshold, for example, one higher than 10. We do not apply any cleansing criteria for patience. However, our results do not change if we exclude non-sensible individuals, classified according to the risk aversion questions, from the patience sample. Throughout the paper, we report the mean gain/loss ratio of the second lottery question because this stake was higher than that of the first question, and the sensibility threshold of the presented results is 5.

We prefer not to use the mean of the estimates of the risk aversion coefficient for each individual's utility function or the jointly estimated values, using all individuals within each country. Under this procedure, the achieved risk aversion coefficients are very poorly scaled and sensitive to changes in assumptions regarding wealth levels and utility functions. Moreover, it is numerically difficult to obtain converging stable estimates for more than half of the data sample. Thus, we find the use of gain/loss ratios as proxies for risk aversion coefficients to be appropriate.

[12]For the US survey, for instance, a 25$ and a 100$ loss were given.

It is crucial to note that in using the INTRA survey data, we do not claim to quantify countries' time preferences or risk aversion coefficients, and the presented values cannot be used quantitatively as estimates for time preference and risk aversion coefficients of a utility function. However, we maintain that these data can serve as good proxies for both measures.

Table II Risk Aversion Across Countries
The risk aversion proxy values are calculated as the mean gain/loss ratio of all participants within each country. The lottery question asks participants to state the minimum amount of gain they would require in a lottery given that there is a 50% chance of losing 100$, such that they would be willing to participate in the lottery for free. For each individual, the selected amount of x is taken to be directly related to the curvature of his or her utility function and hence monotonically related to the risk aversion coefficient. A highly risk averse individual should rationally require a higher x than a less risk averse individual, ceteris paribus. Therefore, the gain/loss ratio of individuals provides a stable proxy for the risk aversion coefficient for individuals, and for each country, we take the average gain/loss ratio of the sample within the country. The results reported are the mean gain/loss ratio of the second lottery question with a larger loss stake (for example, 100$ for the U.S survey) cleansed of non-sensible responses, according to the sensibility threshold of 5.

Country	Risk Aversion	Country	Risk Aversion
Australia	1.5057	India	2.5452
NewZealand	1.5295	Finland	2.5613
Malaysia	1.6052	Spain	2.5744
Lithuania	1.7467	Denmark	2.6039
Argentina	1.7595	Vietnam	2.6829
Netherlands	1.7614	Russia	2.7012
Sweden	1.7954	Colombia	2.751
Portugal	1.8052	Taiwan	2.8782
Belgium	1.8177	Switzerland	2.9294
Turkey	1.824	Hungary	2.9356
Mexico	1.974	Chile	2.9813
USA	2.1197	Germany	3.1093
France	2.1371	UnitedKingdom	3.1848
Austria	2.138	Israel	3.3106
China	2.1477	Croatia	3.6099
Japan	2.1664	SouthKorea	3.8051
Greece	2.177	Romania	4.1634
Italy	2.1778	Canada	4.3303
Ireland	2.1935	Thailand	4.3415
Norway	2.2351	Hongkong	4.4357
		Poland	5.0764

We formed the list of countries analyzed in this paper as the intersection of countries in the INTRA survey and countries in which there are operating financial markets. This resulted in a total of 41 countries. For all countries except the US, we based the stock market universe on data availability in DataStream International over the period from December 1979 to December 2011. For this period, we collected all data for all individual stocks within each country. For the US, we use data provided by Kenneth French. The stock market universe consists of all stocks' common equity securities traded in a country's stock market(s), specified by the country's stock market exchange codes. To avoid survivorship bias, we included all security type statuses except private companies (e.g., active, inactive, delisted) over the entire time period. To avoid doublelisting, our sample consists solely of common stocks, both domestic and foreign, of only primary listings, so there is no overlap of securities across countries. The stock market return of a country is calculated as the value-weighted market index return of all stocks in each time period in all country stock markets. This could be viewed as the return of the broad market index for each country, excluding secondary listings. Note that the stock market indices we have constructed extend those commonly available in most of the countries we consider. In most countries, stock markets do not necessarily have broad market indices that comprehensively cover a country's stock markets; rather, indices cover the top 30 or 100 stocks.

We included countries with market capitalization and price-to-book data for at least 25 stocks over at least 4 years to obtain value profits over a reasonably long time period. Table III summarizes the list of countries included, the total market capitalizations, and the number of firms in different time periods. Throughout the paper, for the main empirical analysis, we used the time period from January 1995 to December 2011. The corresponding time period's sample summary is listed as the second and third time period in the table.

As depicted in Table III, all countries but 5 have sufficient numbers of stocks of reasonable market size. Among countries with very short time periods of observations, such as Lithuania and Vietnam, data are available only for the global crisis period. Similarly, for Romania and Croatia, data are only available from January 2006 onwards. Because the global financial crisis may create structural breaks in our sample, for our main results in the panel setting of this paper, we exclude these countries. In further robustness checks presented in the Internet Appendix, our results include these countries.

4 Returns on Value Portfolios

In this section, we present the profitability of value portfolios based on price-to-book ratios at the end of the previous year. For each country's stock market, we form five quintile portfolios, following the methodology of Fama and French (1992). The bottom quintile is designated as a value portfolio (V), and the top quintile is designated as the growth portfolio (G). Portfolios are equally weighted and non-overlapping. Throughout this paper, returns are reported in US dollars. However, our results do not change when we conduct the analysis in local currencies. We sought to avoid look-ahead bias by diverting slightly from the standard methodology: we rebalance portfolios every month when at least one stock is delisted. Such a stock is not considered part of the portfolio for that month, although it is included in the portfolio in the previous months. Hence, when forming portfolios, we do not expect any given stock to be included over the entire coming year.

Table IV presents the average excess market returns, value portfolio returns, growth portfolio

Table III Summary Statistics
Our sample consists of data on individual stocks from 41 countries' stock markets that were listed and available in DataStream International between December 1979 and December 2011. For the US, we employ data made available by Kenneth French. For each country, we include countries and time periods with at least 25 stocks and data observations on market capitalization and price-to-book ratios over at least five years to obtain value profits over a reasonably long time period. Our sample consists solely of common stocks both domestic and foreign. However, for both, we include only primary listings of stocks. This table presents the list of countries included and the market capitalization and number of firms in the different time periods. For the main regression analysis, we used the time period from January 1995 through December 2011. The corresponding time period's sample summary is listed as the second and third time period in the table.

Country	Time-Period Start - End	Market Cap [# of firms] Starting Year	Market Cap [# of firms] 1995	Market Cap [# of firms] 2011
Argentina	199501-201112	21987[57]	21987[57]	35623[67]
Australia	198101-201112	20298[78]	186327[493]	1166135[1592]
Austria	198801-201112	21191[38]	94019[85]	82284[72]
Belgium	198701-201112	169598[80]	613323[94]	212539[129]
Canada	198101-201112	31055[171]	216424[1186]	1490924[2375]
Chile	199201-201112	91606[119]	69572[143]	249727[133]
China	199401-201112	40246[259]	38726[293]	3182896[2087]
Colombia	200303-201112	9108[36]	11952[27]	180423[39]
Croatia	200601-201112	49569[72]	-	21576[83]
Denmark	198901-201112	19356[117]	33530[172]	162812[180]
Finland	199001-201112	9081[34]	38104[73]	132949[115]
France	198101-201112	22943[89]	590795[563]	1457373[714]
Germany	198101-201112	55446[155]	513062[489]	1107520[923]
Greece	199002-201112	792088[72]	492372[176]	32169[219]
Hongkong	198401-201112	13409[69]	231450[435]	1508424[1146]

Table III Summary Statistics - Continued

Country	Time-Period Start - End	Market Cap [# of firms] Start Year	Market Cap [# of firms] 1995	Market Cap [# of firms] 2011
Hungary	199903-201112	15790[38]	-	18235[36]
India	199301-201112	98581[661]	91890[1173]	992401[2295]
Ireland	198801-201112	6660[39]	16049[42]	92138[37]
Israel	199401-201112	23877[268]	26000[279]	138818[418]
Italy	198401-201112	2429766[58]	34565277[183]	415217[263]
Japan	198101-201112	349174[838]	3562521[2696]	3468264[3536]
Lithuania	200701-201112	2135[32]	-	1083[32]
Malaysia	198701-201112	17426[197]	209310[470]	393861[864]
Mexico	199301-201112	96914[60]	46635[74]	347952[99]
Netherlands	198401-201112	32546[96]	294115[157]	493796[111]
New Zealand	199503-201112	14851[62]	14851[62]	34896[102]
Norway	198801-201112	8346[43]	32848[106]	248784[204]
Poland	199701-201112	9126[60]	2173[24]	130647[353]
Portugal	199001-201112	103509[60]	56182[81]	57353[45]
Romania	200601-201112	28004[111]	-	11200[109]
Russia	200402-201112	125720[54]	-	726692[243]
South Korea	198901-201112	121228[431]	160742[586]	907729[1706]
Spain	198801-201112	220735[48]	597501[104]	524373[125]
Sweden	198801-201112	26396[41]	98874[151]	429048[415]
Switzerland	198501-201112	29394[75]	265624[178]	965819[238]
Taiwan	199302-201112	190354[238]	177599[298]	687128[1525]
Thailand	199101-201112	31941[207]	128111[349]	241067[475]
Turkey	199202-201112	4199[102]	17878[161]	188240[319]
United Kingdom	198101-201112	105268[639]	1137970[1283]	2638962[1373]
USA	197912-201112	546084[3711]	4755021[5816]	13911550[3366]
Vietnam	200801-201112	12197[278]	-	24758[605]

Table IV Value Strategy Returns by Country

This table reports average equity premiums, value portfolio returns, growth portfolio returns, and value portfolio returns minus growth portfolio returns for the entire time period covered by the database. The final column indicates the significance levels of the value premiums (V minus G) for each country. In each country, all stocks are sorted according to price-to-book ratios at the end of the previous year. Portfolios consisting of the lowest quintile of stocks in the sample are value portfolios (V), and portfolios consisting of the highest quintile of stocks in the sample are growth portfolios (G). If a stock is missing a monthly return, it is not considered for that month. If a stock is delisted, we rebalance the portfolio beginning in that month. The value premium for each country is reported in the sixth column, with the corresponding significance levels in the seventh column.

Country	Start Time	Market-Rf	Value	Growth	V minus G	Pval of VMG
Argentina	199501	0.686	1.838	0.868	0.97	0.096
Australia	198101	0.364	2.652	0.801	1.851	0
Austria	198801	0.441	1.83	0.775	1.055	0.006
Belgium	198701	0.268	1.663	0.903	0.76	0.007
Canada	198101	0.454	2.624	1.298	1.326	0
Chile	199201	0.232	2.611	1.265	1.346	0.001
China	199401	0.746	2.026	1.129	0.897	0.041
Colombia	200303	2.039	4.271	2.706	1.565	0.1
Croatia	200601	2.054	4.218	2.929	1.289	0.252
Denmark	198901	0.457	1.639	0.47	1.169	0
Finland	199001	0.653	1.75	0.99	0.76	0.088
France	198101	0.442	2.445	0.88	1.565	0
Germany	198101	0.43	1.619	0.587	1.032	0
Greece	199002	0.164	2.114	0.595	1.519	0.003
Hongkong	198401	1.202	3.107	1.212	1.895	0
Hungary	199903	0.206	2.922	0.935	1.987	0.055
India	199301	0.71	3.08	1.423	1.658	0.003
Ireland	198801	0.431	1.653	0.65	1.003	0.12
Israel	199401	0.371	1.911	1.118	0.793	0.049
Italy	198401	0.555	1.319	0.639	0.68	0.004
Japan	198101	0.168	1.602	0.448	1.153	0
Lithuania	200701	-0.151	2.825	0.356	2.469	0.12
Malaysia	198701	0.934	2.336	0.835	1.501	0

Table IV Value Strategy Returns by Country - Continued

Country	Start Time	Market-Rf	Value	Growth	V minus G	Pval of VMG
Mexico	199301	0.746	2.393	0.966	1.427	0.003
Netherlands	198401	0.514	1.346	1.19	0.156	0.624
New Zealand	199503	0.234	1.956	1.046	0.909	0.045
Norway	198801	0.747	2.066	1.273	0.793	0.047
Poland	199701	0.159	2.35	0.881	1.469	0.016
Portugal	199001	0.149	2.356	0.683	1.673	0.004
Romania	200601	0.168	6.412	1.583	4.829	0
Russia	200402	1.175	4.422	1.92	2.502	0.009
South Korea	198901	0.171	2.397	0.369	2.028	0
Spain	198801	0.183	1.314	0.435	0.879	0.001
Sweden	198801	0.739	1.875	0.785	1.09	0.006
Switzerland	198501	0.616	1.384	0.92	0.464	0.019
Taiwan	199302	0.706	1.926	0.535	1.391	0.014
Thailand	199101	0.516	2.796	0.588	2.208	0
Turkey	199202	0.895	3.867	2.187	1.68	0.007
United Kingdom	198101	0.475	2.006	0.601	1.405	0
USA	197912	0.484	1.672	0.698	0.974	0
Vietnam	200801	-2.059	-1.23	-2.296	1.066	0.365

returns, and value portfolio returns minus growth portfolio returns for all 41 countries in the data sample. The starting dates of the available time period for each country are listed in the second column. All returns are monthly and in US dollars. The results in Table IV show that value minus growth portfolio returns, value premiums, are positive in all countries, consistent with previous studies' findings. However, countries differ in the magnitudes of value returns over growth returns. Seven of our 41 countries do not exhibit significantly positive value premiums, whereas the remaining 34 countries exhibit highly significant value premiums of varying magnitudes. Among the seven countries characterized by insignificant value premiums, Croatia, Lithuania, and Vietnam have very small sample sizes, with sample periods beginning in January 2006, January 2007, and January 2008, respectively. The remaining countries characterized by insignificant value premiums are Argentina, Finland, Hungary, Ireland, and the Netherlands. In addition, China, Israel, New Zealand, and Norway exhibit rather low significance levels over the entire sample period. With respect to average premiums, some northern European countries, such as Belgium, the Netherlands, Sweden, Finland, and Norway, are characterized by low value premiums, whereas Australia, Canada, France, and the United Kingdom exhibit relatively high value premiums.

5 Patience, Risk Aversion, and Value Returns: Portfolio Analysis

In this section, we analyze differences in value portfolio returns across countries as they relate to patience and risk aversion. For this purpose, we first investigate the univariate effects of each preference proxy on value returns. We classify countries into three groups based on levels of patience and risk aversion. The three groups are formed as three quantiles of countries sorted according to patience scores. The portfolio groups range from low (bottom 35%) to high (top 30%) with respect to both patience and risk aversion.

For the sample of 39 countries (with Lithuania and Vietnam excluded because data for these countries only cover the global economic crisis period), over the period from January 1995 to December 2012, mean value premiums and patience have a Spearman rank correlation coefficient of -0.422 with a p-value of 0.007. This result is what we would expect based on the implications of our economic model. The higher the patience level, the lower the time preference coefficient. Thus, an increase in the time preference coefficient (lower patience) positively affects the value premium. Moreover, the Spearman correlation coefficient across countries between value portfolio profits and risk aversion is 0.31 with a p-value of 0.052. The direction of the association is again as expected based on the implications of our economic model. Initial empirical observations show that even with simple means, value premiums are significantly related to time and risk preference.

Table V demonstrates the effect of patience and risk aversion in a simple portfolio analysis, forming country-average portfolios by sorting countries' value and growth portfolios based on countries' scores on patience and risk aversion, respectively. This analysis is very similar to portfolio formation by sorting stocks based on a criterion except that in this case, countries rather than individual stocks are sorted, and equally-weighted value/growth portfolio returns are formed out of countries' value/growth portfolios. All countries in the sample are classified into three groups from low to high based on the values of the corresponding sorting criteria. For each group, the classified countries' value/growth portfolios forms equally weighted country-average portfolio returns. Table V reports the means and t-statistics of country-average value/growth portfolio returns in US dollars. Panels A and B of Table V present country-average portfolios sorted by patience and risk aversion, respectively. Additionally, we report average country value premiums in the final column. Panel A shows that the highest average return of value premiums is achieved by countries with the lowest patience score. Similarly, panel B shows that the highest average return of value premiums is achieved by countries with the highest risk aversion score. The country-average returns do not exhibit a strong monotonic pattern in patience and risk aversion scores in the univariate analysis. However we do not believe this is abnormal because countries' stock markets differ in many dimensions, and many country-specific factors affect stock

Table V Patience, Risk Aversion and Value Profits
This table presents the monthly returns on value and growth strategies in US dollars for country-average portfolios. Country-average portfolios are formed out of equally weighted portfolios. Panel A and panel B present country-average portfolios sorted by patience and risk aversion, respectively. Sorting and portfolio formation are performed so that at the end of each month, all countries in the sample are classified into three groups from low to high based on the values of the corresponding sorting criteria. For each group, the classified countries' value/growth portfolios forms equally weighted country-average portfolio returns for the following month. Panel A reports country-average value portfolio returns with classifications based on country scores on the patience measure. Panel B reports country-average value portfolio returns with classifications based on country scores on the risk aversion proxy measure. The time period considered is December 1994 through December 2011, which yields 204 months of return observations. The corresponding t-statistics are provided in brackets. T-statistics are calculated with heteroscedasticity-adjusted Newey-West standard errors of lag 1.

Sorting Criteria	Country-average portfolios	Value (V)	Growth (G)	V minus G
	Panel A. Sorted with respect to patience proxy			
Patience	Low	2.459 (4.511)	0.886 (1.797)	1.572 (8.228)
	Medium	1.943 (4.164)	0.598 (1.342)	1.3443 (6.261)
	High	1.936 (3.790)	0.893 (1.724)	1.0429 (3.974)
	Panel B. Sorted with respect to risk aversion proxy			
Risk Aversion	Low	2.13 (4.321)	0.892 (1.826)	1.238 (5.8)
	Medium	1.844 (3.697)	0.68 (1.523)	1.163 (5.052)
	High	2.39 (4.483)	0.743 (1.435)	1.647 (8.199)

market returns. Therefore, thorough panel analysis results verify the empirical significance of patience and risk aversion scores on value premiums in the following section.

6 Value Returns Across Countries: Panel Regression

In this section, we use a panel regression to determine the relationships of patience and risk aversion to the value premiums cited above. Additionally, we examine whether these relationships are robust after controlling for major financial and economic differences across countries. We examine other possible cross-country variables that can further explain the differences in value returns across countries. For this, we regress value returns minus growth returns on the patience and risk aversion proxies obtained from INTRA and other potential variables.

$$VMG_{it} = \alpha_0 + \beta_1 Pat_i + \beta_2 RA_i + \gamma_3 C_i + \gamma_4 A_{iy} + \gamma_5 M_{jt} + \varepsilon_{it} \tag{8}$$

where VMG_{it} denotes portfolio value returns minus portfolio growth returns in month t for country i, and Pat_i and RA_i represent the patience and risk aversion proxies, respectively, for country i, as reported in Tables I and II. C_i denotes the list of explanatory variables for country

i that are constant over time, A_{iy} denotes the list of explanatory variables for country i observed at annual frequencies, and M_{it} denotes the list of explanatory variables for country i for month t observed at monthly frequencies. [13] ε_{it} is an error term. We employ the Fama and MacBeth (1973) procedure to estimate equation 8, with t-statistics adjusted for possible heteroscedasticity and autocorrelation according to the method of Newey and West (1994).

We report panel regressions for four regression models, as given in Table VI: panel A presents the results of an analysis of additional behavioral variables; panel B checks for macroeconomic development variables; panel C indicates whether financial development measures have explanatory effects on value premiums; and panel D presents aggregate financial characteristics of various stock markets.

The regression in panel A is used to test additional behavioral variables that have been found in the literature to have explanatory power with respect to equity returns. For example, Chui, Titman, and Wei (2010) shows that cross-country differences in momentum returns can be explained by cultural differences in the individualism scores of Hofstede (2001), employed as a proxy of over-confidence and self-attribution bias. Hofstede (2001) presents one of the most widely accepted studies on cultural differences around the world from a sociological point of view by providing 5 cultural dimensions: Individualism, Power Distance, Uncertainty Avoidance, Masculinity, and Long-Term Orientation[14]. The individualism score represents, quoting Hofstede (2001), a preference for a loosely knit social framework in which individuals are expected to take care of only themselves and their immediate families. Chui, Titman, and Wei (2010) and further references argue that over-optimism, over-confidence, and self-attribution bias are found to be linked to individualism; hence, individualism, as a proxy of over-confidence and self-attribution bias, explains the momentum profits, as suggested by Daniel, Hirshleifer, and Subrahmanyam (1998). Additionally, several studies have suggested that value and momentum returns are related. For example, Lakonishok, Shleifer, and Vishny (1994) shows that investors who extrapolate past earnings far into the future following trends overreact to good and bad news and overinvest in growth stocks, leaving value stocks underappreciated. In such an economy, only contrarian investors benefit from value returns, implying that unless there are momentum chasers, value returns would not exist. Asness (1997) argues that value and momentum returns are negatively associated. In light of these empirical findings, we test whether what we capture as differences in patience and risk aversion can be explained by differences in individualism. Another behavioral variable that has been proposed in the literature to explain equity returns is uncertainty avoidance. Hofstede (2001) defines the uncertainty avoidance di-

[13] Additional descriptions of the variables are provided in the Appendix.

[14] The study provides extensive analyses of a large database of employee value scores collected within IBM between 1967 and 1973 in more than 70 countries. The study shows that each culture can be described by scores in 5 unrelated dimensions in relative terms. For more details online, refer to http://geert-hofstede.com/national-culture.html.

mension as the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity [15]. The uncertainty avoidance score of Hofstede (2001) is examined in a portfolio choice context and is empirically shown to further explain equity premiums across countries, as in Rieger and Wang (2012). For this purpose, we use the uncertainty avoidance index of Hofstede (2001). In panel A of Table VI, we provide regression results for patience and risk aversion values by controlling for the two cultural variables. The results demonstrate that cross-country differences in value premiums are significantly explained by patience and risk aversion, whereas the additional behavioral variables do not change our results. We obtain the expected sign for the individualism index based on the literature, but at a low level of significance. Chui, Titman, and Wei (2010) provides evidence of a positive association between momentum returns and the individualism score. As Lakonishok, Shleifer, and Vishny (1994) and Asness (1997) suggest, the negative or complementary association of value returns with momentum implies a negative association between the individualism index and value profitability across countries. Uncertainty avoidance is found to be statistically insignificant in all regressions.

Panel B in Table VI reports the results of a panel regression of value premiums on patience and risk aversion, controlling for many macroeconomic development measures. We analyze whether the effects we capture, particularly with respect to patience, might be caused by macroeconomic differences between countries. The macroeconomic development variables we consider are GDP per capita, GDP growth, industrial production normalized by GDP, and growth of industrial output. As shown by Wang, Rieger, and Hens (2013), patience is significantly related to GDP per capita and inflation. Additionally, we test whether highly industrialized countries have higher value premiums. According to Zhang (2005), value stocks consist of shares of firms with very large volumes of assets in place, which entails that such firms bear higher adjustment costs, especially during economic downturns. Zhang (2005) concludes that the value spread is mainly the result of value firms bearing the risk of higher costs and thus performing more poorly than growth stock during poor economic times. The only proxy we could obtain for assets in place is industrial production. We believe that higher industrial production should be related to higher industrialization and could be considered a crude proxy for the adjustment costs associated with the assets in place in each country. As panel B shows, patience and risk aversion variables remain significant, whereas GDP growth is shown to significantly explain the value spread. The association between GDP growth and the value spread is found to be negative, implying that higher GDP growth leads to a smaller value spread in a given year. Higher economic growth suggests that the economy is strong; hence, it is likely that stock markets are generally profitable in such periods, causing the value minus growth spread to fall. The remaining macroeconomic variables are found not to be statistically significant.

Panel C in Table VI presents a regression analysis in which we further examine the potential

[15] Hofstede's notion of uncertainty aversion does not pertain to financial uncertainty but to job-related uncertainty.

Table VI **Value Premia Across Countries controlling for other factors: Results of Fama-MacBeth Regressions**

Monthly returns of value minus growth portfolios are regressed on patience, risk aversion, and various other explanatory variables, specifically, the individualism index and the uncertainty avoidance index of Hofstede (2001), growth of industrial production (IndProd Gr), growth of gross domestic product (GDP gr), the ratio of industrial production to GDP (IndProd/GDP), per capita gross domestic product (GDP pc), the ratio of total private credit to GDP (Credit), the ratio of total stock market capitalization to GDP (MCap), the accounting standards index (accounting), inflation, an index of restrictions on capital flows (Rflow), country stock market book-to-market ratio (BtoM), country stock market price-earnings ratio (PE), country stock market cash flow growth volatility (CF Vol), and the median firm size in each country (Firm Size). Panel A reports the results for several other behavioral variables. Panel B presents the results of a check of major economic development measures. Panel C demonstrates the results of tests for possible effects of financial development levels on value premiums across countries. Panel D depicts possible associations of value profits with a country's overall stock market characteristics. T-statistics, calculated with Newey and West (1994) heteroscedasticity and autocorrelation consistent standard errors, are reported in brackets. Min and max sample size for each time period's cross-sectional regression are provided in the bottom section along with the start time period for the data sample through December 2011, with the exception of Panel C because our private credit data are limited to December 2010.

	Panel A: Behavioral	Panel B: Macro. Dev.	Panel C: Financial Dev.	Panel D Fin. Characteristics
Intercept	2.04 (3.37)	2.05 (1.88)	2.23 (1.65)	1.83 (2.74)
Patience	-1.2 (-2.05)	-1.25 (-2.01)	-1.4 (-2.02)	-1.66 (-2.17)
Risk Aversion	0.18 (2.2)	0.19 (2.25)	0.23 (2.6)	0.2 (2.74)
Individualism	-6.86 (-1.76)			
Uncertainty avoidance	-0.05 (-0.13)			
IndProd Gr		0.32 (1.33)		
GDP gr		-0.03 (-2.09)		
IndProd/GDP		-0.4 (-1.21)		
GDP pc		-6.67 (-0.61)		
Credit			0.01 (0.03)	
MCap			-0.06 (-0.28)	
Accounting			0 (-0.27)	
Inflation			-6.09 (-1.51)	
Rflow			-0.02 (-0.36)	
BtoM				14.18 (0.3)
PE				3.77 (2.17)
CF Vol				2.74 (0.02)
Firm Size				-16.26 (-2.24)
Min Sample Size	32	31	21	35
Max Sample Size	36	36	31	35
Start Date	199501	199501	199501	199501

explanatory power of financial development measures. Specifically, we consider the ratio of private credit to GDP, the ratio of total market capitalization to GDP, inflation, accounting standards, and restrictions on capital flows as possible explanatory variables. We use the ratio of total market capitalization to GDP, as suggested by Beck, Demirguc-Kunt, and Levine (2000) and Chan, Covrig, and Ng (2005), and the ratio of total private credit to GDP, as suggested by Stulz and Williamson (2003), as financial development indicators.

A large body of literature addresses the possible effects of inflation on stock markets. Therefore, inflation should be controlled for in the examination of cross-country differences. Because a value strategy involves the use of balance sheet data to form portfolios, we believe that accounting standards are another reasonable control variable. The accounting standard index (Accounting), which defines the amount and transparency of information available to investors, can be viewed as another financial development measure, as suggested by Chan, Covrig, and Ng (2005). Finally, we consider restrictions on capital flows (Rflow), as suggested by Chan, Covrig, and Ng (2005), as a measure of financial market openness. A higher score indicates fewer restrictions on capital flows from foreign investors into local markets and from local investors into foreign markets. The results show that none of the financial development measures explains differences in value premiums observed across countries.

Panel D of Table VI provides the results of further analysis of country financial characteristics. The intuition behind checking country stock market characteristics is that cross-country differences in value returns are likely to be related to such characteristics. Stock markets with many value stocks have lower price-to-book ratios (lower book-to-market, BtoM). The price-earnings ratio (PE) is another ratio of a country's stock market composition of value stocks relative to growth stocks, as a proxy for country's growth opportunities. Higher PE ratio represents higher growth opportunities in a country. Hence, we expect that higher growth opportunities to affect the value premiums positively as implied by our model as demonstrated in Figure 2. Cash flow volatility is another general factor in asset pricing, with higher cash flow volatility implying higher returns. Finally, it has been empirically verified that so-called return anomalies are more prominently observed among small firms. Thus, we expect a country with more small firms to have a larger value premium than a country with more large firms. These factors should, to some extent, explain value premium differences across countries. We test whether the associations of patience and risk aversion with the profitability of value strategies are robust to controlling for growth opportunities and average firm size within each country. Whereas panel D shows that the size effect is apparent in cross-sectional analysis, patience and risk aversion remain highly significant. Furthermore, we find that country price-earnings ratios within a given year are significant, implying that growth opportunities is another explanatory variable for value premiums.

In a further analysis, we add even more controls. However, for the sake of brevity, we prefer not to add any further redundant results. One important effect we observe by combining GDP growth, a country's total market price-earnings ratio, and a country's average firm size is that we lose the significance of GDP growth, which suggests a seemingly unintuitive association between country PE ratios and value premiums. A higher PE ratio might capture low economic development and lower earnings in the overall market. Intuitively, when the economy is performing poorly, we expect the spread between value stock returns and growth stock returns to widen. In such an economy, lower earnings will hurt value stocks more than they hurt growth stocks because growth stocks more strongly reflect future growth opportunities.

7 Time and Risk Preferences and Stock Volatility

In this section, we explore possible associations of patience and risk aversion to stock volatilities, as implied by the asset pricing model given in Equation 6. We determine the effect of patience and risk aversion on average stock volatilities across countries in a panel regression setting. In addition, we explore whether this association is robust to controlling for major risk factors. For this purpose, we regress average stock volatilities on patience and the risk aversion proxy and on other potential explanatory variables.

$$Vol_{it} = \alpha_0 + \beta_1 Pat_i + \beta_2 RA_i + \gamma_3 C_i + \gamma_4 A_{iy} + \gamma_5 M_{jt} + \varepsilon_{it} \tag{9}$$

where Vol_{it} is the average stock volatility in month t for country i, and Pat_i and RA_i are the patience and risk aversion proxies, respectively, for country i, as reported in Table I and II. C_i represents the list of explanatory variables for country i that are constant over time, A_{iy} represents the list of explanatory variables for country i observed at annual frequencies, and M_{it} represents the list of explanatory variables for country i for month t observed at monthly frequencies.[16] ε_{it} is an error term. We employ the Fama and MacBeth (1973) procedure to estimate Equation 9, with t-statistics adjusted for possible heteroscedasticity and autocorrelation, according to the Newey and West (1994) method.

Stock volatility is calculated as , where R^2_{itj} is the squared return of stock j in month t in country i for all stocks $j = 1, 2, ..., n$ in the stock market universe of country i, as suggested by Chui, Titman, and Wei (2010).

In this section, we test hypothesis 3 in a panel setting. We expect that risk aversion amplifies average stock volatility and that patience reduces it, as Equation 6 implies. The intuition is very clear: the price multiplier can be considered a pricing factor that – as in the standard setting – is a function of the first-order derivative of the utility function. Greater curvature of the utility function causes this value to be lower because the marginal utility terms are smaller

[16] Additional descriptions of all variables are provided in the Appendix.

for given changes in consumption, whereas less curvature entails larger changes in marginal utility for given changes in consumption. This results in a decrease in the price multiplier m^i_{T-t} and, hence, an increase in the return multiplier $(m^i_{T-t}+1)/m^i_{T-t}$. Therefore, we expect higher average stock volatility for higher levels of risk aversion. Similarly, an increase in the time preference coefficient, which indicates decreasing patience, will negatively affect the price multiplier. Because the investor values only consumption in the next periods, the summation in the definition of the price multiplier achieves a lower value because less future consumption utility is assigned substantial weight in the summation, indicating that increasing patience amplifies the price multiplier and diminishes the return multiplier. To conclude, we expect patience to be negatively associated with average stock volatilities across countries.

In the literature, stock market volatility has been shown to be associated with the degree of financial development, the volatility of growth rates, the volatility of exchange rates, a country's debt ratio, the prevalence of insider trading (Du and Wei (2004)), the market capitalization to GDP ratio, and financial openness. These studies generally use overall stock market volatility to analyze cross-country differences. In contrast, Chui, Titman, and Wei (2010) reports that stock market volatility, measured as average stock volatility, can be explained by the individualism index, which is a measure of over-confidence and self-attribution bias across countries. Following the seminal work of Chui, Titman, and Wei (2010), in this study, we also examine average stock volatility that is not diversified. Stock market volatility provides a measure of overall diversified stock market volatility across countries.

Table VII presents the panel regression results for the association of average stock volatility with patience and risk aversion across countries. Panel A presents the results of stock volatility regressed on patience, risk aversion, individualism (as a proxy for overconfidence/self attribution bias by Chui, Titman, and Wei (2010)), political risk, the private credits to GDP ratio, and GDP growth volatility for the 1990 to 2011 period, the total market capitalization to GDP ratio, and the foreign exchange rate volatility [17]. Moreover, we find it suitable to control for diversified market volatility to capture the country-specific volatility component and to control for other omitted country volatility-inducing factors, such as investor protection and theprevalence of insider trading. The results of the panel regression are presented in Panel B of table VII.

As expected, patience and risk aversion significantly explain cross-country differences in average stock volatilities. However, in contrast to Chui, Titman, and Wei (2010), we do not find the individualism index to be significant. The significance of individualism increases when we add overall market volatility, which shows that the low significance level might be caused by potentially significant omitted variables. Furthermore, we find that the financial development measure suggested by Stulz and Williamson (2003) is very significant and that it remains significant after controlling for total market volatility. This finding indicates that the more developed a financial

[17]Further descriptions of these variables are provided in the Appendix.

Table VII Average Stock Volatility, Patience and Risk Aversion
This table reports the Fama-MacBeth panel regression results. Monthly average stock volatilities are regressed on patience, risk aversion, and several other explanatory variables, which are Hofstede's individualism index (Individualism), a political risk index (Political Risk), the total private credit to GDP ratio (Credit), gross domestic product real growth volatility (GdpVol), the total market capitalization to GDP ratio (Market Cap), foreign exchange volatility (Fx Vol), and total market return volatility (Market Vol). Panel A lists all potential volatility-related variables in our data sample. Panel B reports the regression results, controlling for total market volatility. We also seek to capture the effects of omitted variables that are associated country stock market volatility. T-statistics, calculated with Newey and West (1994) heteroscedasticity and autocorrelation consistent standard errors, are reported in brackets. The min and max sample sizes for each time period's cross-sectional regression are provided in the bottom section. The data sample runs through December 2010 because total private credit data are limited to this time period.

	Panel A without Market Volatility	Panel B with Market Volatility
Intercept	0.01 (2.062)	-0.001 (-0.082)
Patience	-2.44 (-3.09)	-0.99 (-2.227)
Risk Aversion	0.73 (4.897)	0.618 (6.079)
Individualism	0.063 (0.611)	0.104 (1.216)
Political Risk	0.22 (3.399)	0.327 (3.189)
Credit	-0.087 (-3.005)	-0.039 (-2.759)
GdpVol	0.011 (0.549)	-0.024 (-0.704)
Market Cap	4.377 (3.918)	1.967 (1.044)
Fx Vol	0.066 (0.329)	-0.244 (-3.587)
Market Vol		1.347 (5.8231)
Rsq	0.328	0.428
Adj Rsq	0.085	0.175
Min Sample Size	33	33
Max Sample Size	36	36
Start Date	199501	199501

market is, the lower its average stock volatility observed over time and across countries. This observation might provide evidence that developed financial markets tend to be relatively close to efficient markets and that stock prices in such markets suffer relatively little from abrupt changes and mispricings caused by informational inefficiencies. We do not find real GDP growth volatility to be significant, in contrast to existing findings. The market capitalization to GDP ratio is significant, as shown by Chui, Titman, and Wei (2010) in panel A. However, the effect disappears when we control for overall stock market volatility, as reported in panel B. We have contradictory results with respect to the political risk variable. The index for political risk increases in value with reduced political risk. Thus, we expect that an increase in the political risk index should hypothetically reduce average stock volatility, a result that could be due to limited data availability because we use only the political risk index published for 2010 to 2011. Because past scores may have differed considerably from those for 2010 to 2011, we may simply be capturing a statistical artifact. Indeed, given the recent EURO crisis, it is possible that the data are characterized by such changes. For example, the average scores for 2010 and 2011 for France and Italy are as low as those for Croatia, Chile, South Korea, Slovakia, and Slovenia, for example, and the political risk score for Greece is as low as the scores for Israel, Jordan, Libya, and Mexico. The highest scores are for Finland and Luxembourg.

8 Robustness

8.1 Value Returns Adjusted with Volatility

As the model suggests and the empirical findings confirm, patience and risk aversion affect stock returns in two dimensions. The value premium and average stock volatility are enhanced by increasing risk aversion and decreasing patience (an increase in the time discounting term, β). In this section, we test whether the value spread is also enhanced by increasing volatility.

For this purpose, we normalize the value premiums with yearly volatility of the value premiums for each month. [18] Yearly volatilities are calculated as the standard deviations of monthly value minus growth returns in each year. We perform the same regression analysis given in table VI by using volatility-adjusted value premiums.

Similarly to Table VI and Table VIII, the panel regression results for the four categories given in Table VI yield the following: Panel A provides the results of the analysis of additional behavioral variables; panel B controls for macroeconomic development variables; panel C examines whether financial development measures have explanatory power with respect to value premiums; and panel D shows the aggregate financial characteristics of country stock markets.

[18]This is a simple standardization procedure used to eliminate possible volatility effects in the data.

Table VIII Risk Adjusted Value Returns Across Countries with Other Factors: Results of the Fama-MacBeth Regressions

Standardized value premiums are regressed on patience, risk aversion, and several other explanatory variables, namely, individualism (the uncertainty avoidance index), growth of industrial production (IndProd Gr), growth of gross domestic product (GDP gr), the ratio of industrial production to GDP (IndProd/GDP), per capita gross domestic product (GDP pc), the total private credit to GDP ratio (Credit), the total stock market capitalization to GDP ratio (MCap), the accounting standards index (accounting), inflation, an index of restrictions on capital flows (Rflow), the country stock market book-to-market ratio (BtoM), the country stock market price-earnings ratio (PE), the country stock market cash flow growth volatility (CF Vol), and median firm size in each country (Firm Size). Panel A reports the results for several other behavioral variables. Panel B presents the results, controlling for major economic development measures. Panel C demonstrates the results of a test for possible effects of financial development on value premiums across countries. Panel D depicts possible associations of value profits with a country's overall stock market characteristics. T-statistics, calculated with Newey and West (1994) heteroscedasticity and autocorrelation consistent standard errors, are reported in brackets. Min and max sample sizes for each time period cross-sectional regression are provided in the bottom section. The data sample runs through December 2011, with the exception of Panel C becauseour private credit data are limited to December 2010.

	Panel A: Behavioral	Panel B: Macro. Dev.	Panel C: Financial Dev.	Panel D Fin. Characteristics
Intercept	0.465 (5.328)	0.052 (0.27)	0.115 (0.68)	0.55 (4.473)
Patience	-0.357 (-3.732)	-0.414 (-4.238)	-0.363 (-3.347)	-0.336 (-3.63)
Risk Aversion	0.0408 (2.702)	0.049 (3.012)	0.036 (2.26)	0.028 (1.85)
Individualism	0.053 (0.0806)			
Uncertainty avoidance	-0.143 (-2.545)			
IndProd Gr		0.915 (0.346)		
GDP gr		-0.227 (-1.274)		
IndProd/GDP		-0.023 (-0.487)		
GDP pc		3.6003 (1.9153)		
Credit			-0.021 (-0.467)	
MCap			0.033 (1.122)	
Accounting			0.005 (2.859)	
Inflation			-0.28 (-0.44)	
Rflow			-0.001 (-0.157)	
BtoM				-6.038 (-0.879)
PE				0.57 (2.085)
CF Vol				8.224 (0.303)
Firm Size				-4.292 (-3.262)
Min Sample Size	32	31	21	35
Max Sample Size	36	36	31	35
Start Date	199501	199501	199501	199501

We find that the associations of patience and risk aversion with value premiums remain highly significant in all four panel regression settings. Moreover, we find that the relationship of the uncertainty avoidance index of Hofstede (2001) to volatility-adjusted value profits is significantly negative. We lose the significance of GDP growth, but GDP per capita remains significantly positive. In panel C, we observe that accounting standards increase volatility-adjusted value premiums. In Panel D, we observe exactly the same associations, although the risk aversion coefficient has a rather low significance level.

9 Conclusion

In the present study, we show that heterogenous time preferences resulting in hyperbolic time preferences for the aggregate representative agent with a CRRA utility can rationalize the value premium puzzle by assuming the main cash-flow characteristics of value and growth firms. As Lakonishok, Shleifer, and Vishny (1994) demonstrates, expected cash-flow growth for the growth firm is expected to be strictly higher than the expected cash-flow for the value firm. Second, as Zhang (2005) Lettau and Wachter (2007) argued, the correlation of cash-flows of value firms to concurrent consumption is strictly higher than correlations of cash-flows of growth firms to consumption. In such an economy we show that aggregate patience and risk aversion levels effects the cross-section of stocks returns such that CAPM value premium puzzle can be rationalized.

In such an economy, hyperbolic patience coefficient decreases the value premiums and risk aversion coefficient increases the value premiums. The effects carry to average stock volatilities in the economy however effects on volatility are not large enough to cancel the effects on the returns. Hence the model implies that patience decreases the Sharpe Ratio of value premiums and risk aversion increases the Sharpe Ratio of value premiums. We further show that the effects we capture are not likely to be caused by our main specifications.

To test the model implications, we collect a large panel of stocks from countries around the world and employ a large international survey data for individual time and risk preferences from INTRA. We present the largest international study of a number of countries for value premiums around the world and analyze the profitability of value investing across countries. We show that all countries except 5 provide significantly positive value premiums. Moreover, by merging risk aversion and time preference (patience) data across countries provided by INTRA and large panel value premiums, we show that both predictions of the stochastic dividend-growth model for time preference and risk aversion are empirically supported. Simple portfolio analysis shows that the top quintile of risk aversion countries and the bottom quintile of patience countries have the highest value portfolio minus growth portfolio returns. In the panel regressions, we further control for other other potential cross-country variables. We show that macro-economics and financial development measures do not yield significant coefficients in explaining the differences in magnitudes of value premiums. However, we find that value premiums are negatively related to average firm size and are positively related to stock market price-earnings ratio as a proxy of growth opportunities, whereas we do not find stock market cash-flow volatility significant. To test the model implications regarding stock volatility, we analyze whether patience and risk aversion affect average stock volatility across countries in a panel setting. We show that patience is negatively associated and risk aversion is positively associated with average stock volatility. In the analysis, we also control for stock market volatility to capture the potential effects caused by omitted country-specific risk factors and many other potential country risk factors. The coefficients of patience and risk aversion remain significant, controlling for many country-specific risk factors. Furthermore, we examine the effects of patience and risk aversion on value premiums by adjusting the value premiums with volatility and find that patience and risk aversion remain highly significant, explaining cross-country differences in the risk-adjusted value premiums.

Nonetheless, our results rely on a few debatable assumptions. Our risk aversion and time preference data are limited to cross-sectional observations and are available with limited accuracy, a drawback of employing survey data. However, we believe that time preference and risk aversion scores for countries relative to each other do not evolve or change substantially over time, as also argued by Hofstede (2001). For our results to be valid for all time periods, we need the implicit assumption that the order of countries with respect to patience and risk aversion does not change significantly over time. Moreover, for the accuracy of our risk aversion score, we use the most stable calculation method, as suggested by Harrison and E.Rutstrom (2008), and cleanse the data very lightly. We show in the Appendix that the effects of data cleansing do not change our findings.

To conclude, in this study, we provide strong empirical evidence that the value premium exists internationally and that differences across countries can be explained by differences in the risk aversion and patience scores of countries. Our results provide very substantial supporting empirical evidence for both explanations regarding risk-based models and (seemingly suboptimal) investor behaviours of value premiums. Moreover, our study is the first to provide empirical evidence that time preferences and risk aversion across countries differ and that these differences have significant effects on stock returns and volatility, supporting the increasing number of studies showing that cultural and behavioral differences may have significant impacts on financial variables.

The financial research literature, by contrast, has neglected this issue, focusing largely on the US stock market. Our study indicates that for both academics and practitioners, the study of international markets should not necessarily rely on empirical findings largely based on the US stock market without adapting the findings to local markets.

Further research could analyze whether the international approach, employed here to examine the value premium puzzle, may also be fruitful in examining other asset pricing puzzles, such as the asymmetric volatility puzzle, whereby stock market volatility increases in bear markets. The empirical pricing kernel puzzle is another well-known pricing puzzle first observed in US data. Exploring the explanatory power of differences in investor behaviors and their effects on asset pricing puzzles may be key to understanding what causes a puzzle, especially when there are several competing explanations.

Moreover, understanding heterogeneity in investor preferences and beliefs and how this heterogeneity plays a role in aggregation problem. Improving the representative agent definitions according to the implications of heterogeneity in aggregate terms may be a novel approach to improve asset pricing models. This may rationalize other asset pricing anomalies which may simply be caused by incorrect representative agent specifications.

Understanding the implications of differences in investor preferences and behaviors associated with cultural and socioeconomic differences is also vital to the design of many important financial and economic policies. It is possible that an economic policy could be very successful in one country and a complete failure in another country, as Marcheggiano and Miles (2013) in Bank of England conclude by combining the INTRA data with data on fiscal policy. The recent EURO crisis sheds light on this implication. In this respect, acknowledging differences between investors can also be important in the design of stock market regulations or the development of new global financial products.

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A Model Calibration

Table IX Model Calibration and Simulation
This table presents the calibrated values of the parameters of the model. Parameters are calibrated so that convergence of the price multiplier terms for all assets is assured. Convergence is assured in the limit case only for sufficiently large time discounting coefficients and reasonable levels of risk aversion given the consumption and firm cash flow dynamics. Simulation results based on the calibrated values of parameters.

Model Calibration	
Parameters	Values
Risk aversion α	5.50
Time Preference β	0.96
Hyperbolic Time Discount Coefficient δ	0.835
Mean cash flow growth of firm 1 (Value) μ^1	0.04
Mean cash flow growth of firm 2 (Growth) μ^2	0.07
Mean growth of consumption μ^C	0.015
Volatility of cash flow growth of firm 1 (Value) σ^1	0.32
Volatility of cash flow growth of firm 2 (Growth) σ^2	0.32
Volatility of consumption growth σ^C	0.075
Correlation between firm 1 cash flow growth and consumption growth $\rho^{1,C}$	0.55
Correlation between firm 2 cash flow growth and consumption growth $\rho^{2,C}$	0.35
Model Simulation Results	
Price Earnings Ratio of Firm 1 (Value) δm^1	13.32
Price Earnings Ratio of Firm 2 (Growth) δm^2	225.36
Return multiplier on Firm 1 (Value) $\frac{\delta m^1+1}{\delta m^1}$	1.0751
Return multiplier on Firm 2 (Growth) $\frac{\delta m^2+1}{\delta m^2}$	1.0044
Expected Return on Firm 1	0.118
Expected Return on Firm 2	0.075
Expected Return on Market (Equally Weighted)	0.0964
Return on Risk Free (Constant)	0.023
Volatility of Return on Firm 1	0.348
Volatility of Return on Firm 2	0.325
Volatility of Market	0.334
Sharpe Ratio of Firm 1	0.259
Sharpe Ratio of Firm 2	0.145
Sharpe Ratio of Market	0.20

B Proofs and Derivations

Proof. [Proof of Proposition 1]

The Euler equation of the optimization problem of the representative agent with CRRA utility function is with the naive price system for time t:

$$q_t^i = \delta\beta\mathbb{E}_t\left[\frac{U'(C_{t+1})}{U'(C_t)}\left(q_{t+1}^i + \pi_{t+1}^i\right)\right], \tag{B.1}$$

and for any time $\tau > t$

$$q_\tau^{i(n)} = \beta\mathbb{E}_\tau\left[\frac{U'(C_{\tau+1})}{U'(C_\tau)}\left(q_{\tau+1}^i + \pi_{\tau+1}^i\right)\right], \ \tau = t+1, t+2 \tag{B.2}$$

By forward iteration and using the assumption that all shocks are i.i.d over time following time periods' conditional expectations in the first expectation drop by the law of iterated expectations,we achieve

$$q_t^i = \delta\mathbb{E}_t\left[\sum_{s=1}^{\infty}\beta^s\frac{U'(C_{t+s})}{U'(C_t)}\pi_{t+s}^i\right], \ t = 0, 1, ... \tag{B.3}$$

The first-order derivative of the CRRA utility function is $U'(C) = C^{-\alpha}$; substituting the functional expression in the first order optimality condition, we obtain:

$$q_t^i = \delta\mathbb{E}_t\left[\sum_{s=1}^{\infty}\beta^s\frac{C_{t+s}^{-\alpha}}{C_t^{-\alpha}}\pi_{t+s}^i\right]. \tag{B.4}$$

The cash flow and consumption growth dynamics can be expressed as follows:

$$C_{t+s} = (1+g^C)^s C_t \tag{B.5}$$

$$\pi_{t+s}^i = (1+g^i)^s\pi_t^i, \ \forall \ i = 1, 2 \tag{B.6}$$

$$\pi_{t+s}^0 = (1+g^0). \tag{B.7}$$

Substituting the consumption and cash-flow expressions, we obtain

$$q_t^i = \delta\mathbb{E}_t\left[\sum_{s=1}^{\infty}\beta^s\frac{\left(C_t(1+g^C)^s\right)^{-\alpha}}{C_t^{-\alpha}}(1+g^i)^s\pi_t^i\right] \tag{B.8}$$

and the realized cash flow π_t^i is removed from the expectation, which is a conditional expectation of time t and as stochastic growth processes g_t^C, g_t^i, $\forall i = 1, 2$ are i.i.d over time, [19] and the expectation is a linear operator; hence, we can simplify the expression for the price multiplier

[19]The independence property of random variables allows us to employ the equality of $\mathbb{E}[X_1X_2] = \mathbb{E}[X_1]\mathbb{E}[X_2]$ where X_1 and X_2 are independent random variables, and if X_1 and X_2 are identically distributed, $\mathbb{E}[X_1] = \mathbb{E}[X_2]$, and $\mathbb{E}[X_1X_2] = \mathbb{E}[X_1]^2 = \mathbb{E}[X_2]^2$ holds.

further as follows:

$$q_t^i = \delta \underbrace{\sum_{\tau=1}^{\infty} \beta^s \mathbb{E}_t \left[\frac{1+g_\tau^i}{(1+g_\tau^C)^\alpha} \right]^s}_{m^i} \pi_t^i, \text{ and for time } s > t, \; q_s^{i(n)} = m^i \pi_t^i. \tag{B.9}$$

We assume that the parameter values satisfy the convergence condition for the infinite sum m^i, that is,

$$\beta \mathbb{E} \left[\frac{1+g_t^i}{(1+g_t^C)^\alpha} \right] < 1.$$

By using the geometric series expansion, when the convergence condition is satisfied, we attain:

$$m^i = \sum_{s=1}^{\infty} \beta^s \mathbb{E} \left[\frac{1+g_t^i}{(1+g_t^C)^\alpha} \right]^s = \frac{\beta \mathbb{E}\left[\frac{1+g_t^i}{(1+g_t^C)^\alpha}\right]}{1-\beta \mathbb{E}\left[\frac{1+g_t^i}{(1+g_t^C)^\alpha}\right]}. \tag{B.10}$$

However, dynamic inconsistency results in a shift in prices as the optimal consumption allocation changes over time, supported price system changes accordingly with δ: The (realized) price system then follows the (naive) prices system by a δ shift for any time $s > t$:

$$q_s^i = \delta q_s^{i(n)} \tag{B.11}$$

The excepted returns employing the (realized price system) is then:

$$\begin{aligned} \mathbb{E}_t \left[R_{t+1}^i \right] &= \mathbb{E}_t \left[\frac{q_{t+1}^i + \pi_{t+1}^i}{q_t^i} \right] = \mathbb{E}_t \left[\frac{\delta m^i \pi_{t+1}^i + \pi_{t+1}^i}{\delta m^i \pi_t^i} \right] = \frac{\delta m^i + 1}{\delta m^i} \mathbb{E}_t \left[1 + g^i \right] \\ &= \left(\frac{1}{\delta \beta \mathbb{E}\left[\frac{1+g_{\tau'}^i}{(1+g_{\tau'}^C)^\alpha}\right]} - \frac{1}{\delta} + 1 \right) (1+\mu_g^i) \end{aligned}$$

Alternatively, we can then formulate the representative agent's optimization problem by adopting the correct price system for future time periods:

$$\max_{\{\theta_t^0, \theta_t^1, \theta_t^2\}_t} U(C_t) + \delta \sum_{s=t+1}^{T} \beta^s \mathbb{E}\left[U(C_s)\right] \quad \text{s.t. for all time periods } t = 0, 1, 2, ..., T-1 \tag{B.12}$$

$$C_t + \theta_t^0 q_t^0/\delta + \theta_t^1 q_t^1/\delta + \theta_t^2 q_t^2/\delta = W_t + \theta_{t-1}^0 (q_t^0/\delta + \pi_t^0) + \theta_{t-1}^1 (q_t^1/\delta + \pi_t^1) + \theta_{t-1}^2 (q_t^2/\delta + \pi_t^2)$$

$$\theta_{-1}^i = 1, \; \forall \; i = 1, 2, \text{ and } \theta_{-1}^0 = 0$$

Then first order condition yields:

$$q_t^i = \mathbb{E}_t\left[\beta\frac{U'(C_{t+1})}{U'(C_t)}\left(q_{t+1}^i + \delta\pi_{t+1}^i\right)\right] \tag{B.13}$$

and the Euler Equation as we obtain

$$1 = \beta\mathbb{E}_t\left[\frac{U'(C_{t+1})}{U'(C_t)}R_{t+1}^i + \frac{U'(C_{t+1})}{U'(C_t)}(\delta-1)(1+g^i)\frac{q_t^i}{\pi_t^i}\right]. \tag{B.14}$$

Following the similar steps as above, the the price system then follows:

$$q_t^i = \sum_{s=1}^{\infty}\delta\beta^s\mathbb{E}\left[\frac{1+g_t^i}{(1+g_t^C)^\alpha}\right]^s\pi_t^i = \delta\frac{\beta\mathbb{E}\left[\frac{1+g_t^i}{(1+g_t^C)^\alpha}\right]}{1-\beta\mathbb{E}\left[\frac{1+g_t^i}{(1+g_t^C)^\alpha}\right]}\pi_t^i \tag{B.15}$$

where the expected returns results in the same formula:

$$\mathbb{E}_t\left[R_{t+1}^i\right] = \left(\frac{1}{\delta\beta\mathbb{E}\left[\frac{1+g_{\tau'}^i}{(1+g_{\tau'}^C)^\alpha}\right]} - \frac{1}{\delta} + 1\right)(1+\mu_g^i)$$

□

Corollary 1. *The risk-free asset price and return rate has constant non stochastic value of*

$$q_t^0 = \delta m^0(1+g^0), \tag{B.16}$$

$$R^f = \frac{\delta m^0 + 1}{\delta m^0}, \tag{B.17}$$

where the multiplier for the risk free asset is

$$m^0 = \delta\sum_{s=1}^{\infty}\beta^s\mathbb{E}\left[\frac{1}{(1+g_t^C)^\alpha}\right]^s. \tag{B.18}$$

Proof. We recall the first order condition of the representative agent's problem with respect to the risk-free asset allocations and after some rearrangements, we obtain:

$$q_t^0 = \delta\sum_{s=1}^{\infty}\beta^s\mathbb{E}_t\left[\frac{1}{(1+g^C)^\alpha}\pi_{t+s}^0\right] \tag{B.19}$$

$$\tag{B.20}$$

and we have $\pi_t^0 = 1+g^0,\ \forall t$

$$q_t^0 = \delta \underbrace{\sum_{s=1}^{\infty} \beta^s \mathbb{E}_t \left[\frac{1}{(1+g^C)^\alpha} \right]}_{m^0} (1+g^0), \tag{B.21}$$

where the conditional expectation for all time t is equivalent to the unconditional expectation because the infinite sum is time t independent. The risk-free rate of return is then

$$q_t^0 = \delta m^0 \pi_t^0 = \delta m^0 (1+g^0) \Rightarrow \; R_t^F = \frac{\delta m^0 + 1}{\delta m^0}.$$

□

Corollary 2. *The price-to-book ratio of the firms can be expressed as*

$$\frac{q_t^i}{K^i} = \delta m^i (1+g_\tau^i)^t a^i.$$

Proof. The proof of Corollary 2 follows directly from Proposition 1 by substituting the time $t=0$ cash flows $\pi_0^i = a^i K^i$, where K^i denotes the initial capital invested in firm i, representing the book value of the firm. The initial profitability ratio a^i can be viewed as return on capital for firm i, and it models the time $t=0$ cash flows of the firm. At a later time period, a firm's cash flow grows with a stochastic rate of g^i. We have

$$\pi_0^i = a^i K^i, \text{ and } q_t^i = \delta m^i \pi_t^i, \tag{B.22}$$

the forward iteration of cash-flow growth dynamics leads to

$$\pi_1^i = (1+g^i)\pi_0^i = (1+g^i) a^i K^i, \tag{B.23}$$

$$\pi_t^i = (1+g^i)\pi_{t-1}^i = (1+g^i)^t a^i K^i. \tag{B.24}$$

Substituting the expression we obtain to the asset price expression, we obtain

$$\frac{q_t^i}{K^i} = \delta m^i (1+g^i)^t a^i. \tag{B.25}$$

□

B.1 Identifying Value and Growth Firms

Analyzing the price dynamics in relation to the initial profitability ratios of the firms provides proxies for the price-earnings ratios and the price-to-book ratios. In particular, in this paper, we use price-to-book ratios to identify value and growth firms empirically. Thus, comparing the two price-earnings ratios, for firm 1 to be a value firm and firm 2 to be a growth firm, the model must imply that firm 1 has a lower price-earnings ratio and a lower price-to-book ratio than firm 2. Comparisons of price-earnings ratios in this model are easily inferred by comparing the constant price multipliers m^i. Moreover, we use the initial capital and initial capital profitability definitions of firms' cash flows to obtain expressions for firms' price-to-book ratios.

Condition 1. *The price earning ratios for firms must satisfy the following relationship:*

$$\frac{q_t^1}{\pi_t^1} = \delta m^1 < \delta m^2 = \frac{q_t^2}{\pi_t^2}. \tag{B.26}$$

Condition 2. *The price-to-book ratios, derived in Corollary 2 in the appendix, for firms $i = 1, 2$ satisfy the following relationship:*

$$\frac{q_t^1}{K^1} = \delta m^1 (1 + g_\tau^1)^t a^1 < \delta m^2 (1 + g_\tau^2)^t a^2 = \frac{q_t^2}{K^2}. \tag{B.27}$$

Assuming that both firms pay out all profits they earn in excess of capital depreciation results in a constant capital stock K^i over time. Thus, cash flow growth can be attributed solely to technological progress. Moreover, we assume that differences between firms caused by distinctive initial rates of profitability on capital and cash flow distribution parameters are sufficiently small so that condition B.26 implies condition B.27.

Simulation results of the calibrated model are presented in Table IX. We observe that the assumption of differing correlations with aggregate consumption is sufficient to model differences in the price multipliers m_{T-t}^i, that is, price-earnings ratios. The differences in the price multipliers are very large and imply that firms' price-to-book ratios meet condition B.27 for a wide range of initial profit rates for both firms. The only circumstance in which this condition is not satisfied is when the cash-flow growth rate and the initial profitability of firm 1 are both much higher compared to firm 2. However, we believe that such large differences in both rates of growth and initial profitability are not plausible. First is that empirical observations show that value firms have lower cash-flow growth compared to growth firms. Moreover, in a case with decreasing returns to scale, high initial profitability (return-to-capital rate) is usually accompanied by lower expected profit growths, whereas lower initial profitability is accompanied by higher expected profit growths unless the risks of the two cash-flow growths are very different. Given that possible differences between firms' initial profitability rates $a^i,\ i = 1, 2$ and between firms' profit growth rates $g^i,\ i = 1, 2$ presumably may potentially cancel out, condition B.27 is generally satisfied. This leads us to conclude that firm 1 represents a value firm and that firm 2 represents as a growth firm, as initially assumed.

B.2 Special case: Gordon (1959) Model

Case 1. *A special case of our model where the representative agent has a risk aversion of $\alpha = 0$ and a time discount coefficient $\beta = 1/(1+r), \delta = 1$ and $\sigma^i = 0,\ \forall i = 1, 2$ in the limit where $T \to \infty$ results in constant dividend growth model as shown by Gordon (1959); Brealey, Myers, and Allen (2007). A risk aversion coefficient of $\alpha = 0$ leads to a risk-neutral agent:*

$$U(C) = \frac{C^{1-\alpha}}{1-\alpha} = C. \tag{B.28}$$

Recalling the asset price dynamics, substituting the conditions of the special case in the asset pricing dynamics in Equation B.9 given that $\sigma^i = 0,\ \forall i = 1, 2,$ the stochastic terms diminish $g^i = \mu^i$ and expectation drops, we obtain

$$q_t^i = \mathbb{E}_t \left[\sum_{\tau=1}^{\infty} \left(\frac{1 + g_{\tau'}^i}{1 + r} \right)^{\tau} \right] \pi_t^i = \sum_{\tau=1}^{\infty} \left(\frac{1 + g_{\tau'}^i}{1 + r} \right)^{\tau} \pi_t^i, \tag{B.29}$$

which reduces to the constant dividend growth formula by sum of geometric series:

$$q_t^i = \frac{\pi_{t+1}^i}{r - \mu^i}. \tag{B.30}$$

In this case, the prices of the two firms would be exactly identical when the calibration parameters are considered, and there would not be a value premium. Both firms asset returns are the equal to $1 + r$.

B.3 Hyperbolic Discounting Effect in a setting of Gordon (1959)

Case 2. *In this special case we allow all the model specifications of Case 1 except that we keep that the representative agent has hyperbolic discounting and risk neutral utility function with a risk aversion of $\alpha = 0$ in our setting.*

Recalling the Equation B.15, we substitute the parameter specifications of the special case:

$$q_t^i = \delta \frac{\left[\frac{1+\mu_t^i}{1+r}\right]}{1 - \left[\frac{1+\mu_t^i}{1+r}\right]} \pi_t^i \tag{B.31}$$

$$= \delta \frac{(1+\mu_t^i)\pi_t^i}{(1+r)\left(1 - \frac{1+g^i}{1+r}\right)} \tag{B.32}$$

$$= \delta \frac{\pi_{t+1}^i}{(r - \mu^i)} \tag{B.33}$$

In this case the resulting asset returns are quite different than in Case 1:

$$R_{t+1}^i = \frac{q_{t+1}^i + \pi_{t+1}^i}{q_t^i} = 1 + \frac{r}{\delta} + \frac{\delta - 1}{\delta}\mu^i. \tag{B.34}$$

As $\delta < 1 \Rightarrow (\delta - 1) < 0$, *the expected return is the lower as the cash-flow growth increases. The value premium in this economy is positive and equal to*

$$R_{t+1}^1 - R_{t+1}^2 = \frac{\delta - 1}{\delta}(\mu^1 - \mu^2) > 0, \quad \textit{when } \mu^1 \ < \ \mu^2. \tag{B.35}$$

C Description of Variables

Variable	Type	Description
		I. Cultural Variables
Patience	Cross-section	A higher score indicates a higher patience and a lower time preference coefficient, according to the time discounting term $\frac{1}{1+\beta}$. The higher is one's patience, the more important future consumption is to the individual. Source: INTRA
Risk Aversion	Cross-section	A higher score indicates greater curvature of the utility function and hence higher risk aversion. Measured as the gain required to compensate for a given loss as a 50-50 chance. source: INTRA
Individualism	Cross-section	A higher score indicates a higher degree of individualism. Source: Hofstede (2001)
Uncertainty avoidance	Cross-section	A higher score indicates a higher degree of uncertainty avoidance. Source: Hofstede (2001)
		II. Economic Development Variables
GDP growth	Cross-section & annual time series	Yearly growth of GDP in U.S. dollars. Source: Global Financial Data
Industrial Production Growth (IndProd GR)	Cross-section & monthly time series	Monthly growth of Industrial Production Volume in U.S. dollars. Source: Global Financial Data
GDP per capita (GDP pc)	Cross-section & annual time series	GDP per capita in U.S. Dollars. Source: Global Financial Data
Industrial Production Volume to GDP Ratio (IndProd/GDP)	Cross-section & monthly time series	Monthly Industrial production volume divided by yearly GDP observations. Source: Global Financial Data

Variable	Type	Description
	III. Financial Development Variables	
Total private credits (Credit)	Cross-section & annual time series	Total private credit of a country in a given year divided by the country's GDP for that year. Source : World Bank, Global Financial Development Data
Total market capitalization to GDP ratio (MCap)	Cross-section & monthly time series	Total market capitalization of DataStream Country Indices in U.S. dollars divided by GDP in U.S. dollars for that year. Source: DataStream and Global Financial Data
Accounting Standards (Accounting)	Cross-section	The index assigns lower ratings to low accounting standards. Source: Chan, Covrig, and Ng (2005)
Restrictions to capital flows (Rflow)	Cross-section	The index assigns lower ratings to countries with more restrictions on foreign capital transactions. Source: Chan, Covrig, and Ng (2005)
Inflation	Cross-section & annual time series	Calculates using country consumer price indices. Source: Global Financial Data
	IV. Financial Market Characteristics	
Book-to-market (BtoM)	Cross-section & monthly time series	Book-to-market data of DataStream Country Index for each country. Source: DataStream
Price Earnings Ratio	Cross-section & monthly time series	Price-Earnings ratio of DataStream Country Index for each country. Source: DataStream
Volatility of Cash-Flow growth rates (CF Vol)	Cross-section & annual time series	The standard deviation of each country's cash flow growth rate in the 60-month period prior to the relevant year. The cash flows of each country for each month are calculated as the ratio of the price index and price to cash-flow index of the country index for each country. The growth rates in each month are computed as $ln(CF_{it}/CF_{it-12})$ Source: DataStream
Firm Size	Cross-section & annual time series	The median of the average firm size of firms in each country in each month. The average size of a firm in year y is the average of the monthly market capitalizations of the firm for that year. (measured in U.S. dollars). Source: DataStream

Variable	Type	Description
		V. Other Variables
Political risk index	Cross-section	A higher value indicates a lower political risk. Cross sectional values are calculated from 2010 and 2011 observations. Source: International Country Risk Guide (ICRG)
Market Volatility (Market Vol)	Cross-section & monthly time series	Market volatility is calculated as the squared market return of the DataStream country index for each month for each country
Foreign Exchange Volatility (Fx Vol)	Cross-Section & annual time series	Fxvol in year y in country j is the coefficient of variation of country j's currency against the U.S. dollar in the 60-month period preceding year y. The Fxvol for the U.S. is zero.
Real GDP per capita Volatility (Gdp Vol)	Cross-section	Gdp per capita of country j are the standard deviation of a country's real GDP per capita growth rate over the period from 1990 to 2011 (also checked for 1988 to 2011, and 1995 to 2011)

D Further Robustness with Respect to Cleaning Procedures

D.1 Data Cleaning: Patience Sample also cleansed - threshold 5

Table X Value Premia Across Countries controlling for other factors: Results of Fama-MacBeth Regressions Monthly returns of value minus growth portfolios are regressed on patience, risk aversion and various other explanatory variables, specifically, the individualism index and the uncertainty avoidance index of Hofstede (2001), growth of industrial production (IndProd Gr), growth of gross domestic product (GDP gr), the ratio of industrial production to GDP (IndProd/GDP), per capita gross domestic product (GDP pc), the ratio of total private credit to GDP (Credit), the ratio of total stock market capitalization to GDP (MCap), the accounting standards index (accounting), inflation, an index of restrictions on capital flows (Rflow), country stock market book-to-market ratio (BtoM), country stock market price-earnings ratio (PE), country stock market cash flow growth volatility (CF Vol) and the median firm size in each country (Firm Size). t-statistics, calculated with Newey-West heteroscedasticity and autocorrelation consistent standard errors, are reported in brackets. Min and max sample size for each time period cross-sectional regression are provided in the bottom section along with the start time period for the data sample through December 2011, with the exception of Panel C, as our private credit data are limited to December 2010. Patience and Risk Aversion Proxies are calculated with data cleansing procedure of sensibility criterion on answers of survey subjects to curvature questions as explained in the data section of the paper. The threshold considered here is 5. The insensible subjects are excluded from patience questions as well.

	Panel A: Behavioral	Panel B: Macro. Dev.	Panel C: Financial Dev.	Panel D Fin. Characteristics
Intercept	2.01(3.39)	2.06(1.91)	2.12(1.6)	1.83(2.68)
Patience	-1.17(-2.05)	-1.23(-1.99)	-1.39(-2.07)	-1.59(-2.14)
Risk Aversion	0.19(2.22)	0.19(2.28)	0.24(2.58)	0.21(2.78)
Individualism	-6.89(-1.75)			
Uncertainty Aversion	-0.05(-0.12)			
IndProd Gr		0.32(1.31)		
GDP gr		-0.03(-2.2)		
IndProd/GDP		-0.39(-1.18)		
GDP pc		-6.58(-0.61)		
Credit			0.04(0.13)	
MCap			-0.07(-0.34)	
Accounting			0(-0.22)	
Inflation			-5.99(-1.47)	
Rflow			-0.02(-0.35)	
BtoM				9.09(0.19)
PE				3.71(2.14)
CF Vol				0.1(0)
Firm Size				-16.47(-2.25)
Min Sample Size	32	31	21	35
Max Sample Size	36	36	31	35
Start Date	199501	199501	199501	199501

D.2 Data Cleaning: threshold=10

Table XI Value Premia Across Countries controlling for other factors: Results of Fama-MacBeth Regressions Monthly returns of value minus growth portfolios are regressed on patience, risk aversion and various other explanatory variables, specifically, the individualism index and the uncertainty avoidance index of Hofstede (2001), growth of industrial production (IndProd Gr), growth of gross domestic product (GDP gr), the ratio of industrial production to GDP (IndProd/GDP), per capita gross domestic product (GDP pc), the ratio of total private credit to GDP (Credit), the ratio of total stock market capitalization to GDP (MCap), the accounting standards index (accounting), inflation, an index of restrictions on capital flows (Rflow), country stock market book-to-market ratio (BtoM), country stock market price-earnings ratio (PE), country stock market cash flow growth volatility (CF Vol) and the median firm size in each country (Firm Size). t-statistics, calculated with Newey-West heteroscedasticity and autocorrelation consistent standard errors, are reported in brackets. Min and max sample size for each time period cross-sectional regression are provided in the bottom section along with the start time period for the data sample through December 2011, with the exception of Panel C, as our private credit data are limited to December 2010. Patience and Risk Aversion Proxies are calculated with data cleansing procedure of sensibility criterion on answers of survey subjects to curvature questions as explained in the data section of the paper. The threshold considered here is 10. The insensible subjects are not excluded from patience questions as well.

	Panel A: Behavioral	Panel B: Macro. Dev.	Panel C: Financial Dev.	Panel D Fin. Characteristics
Intercept	2.02(3.4)	2.05(1.88)	2.28(1.64)	2.04(3.19)
Patience	-1.2(-2)	-1.18(-1.87)	-1.41(-1.98)	-1.63(-2.11)
Risk Aversion	0.17(2.07)	0.16(1.85)	0.2(2.01)	0.16(2.13)
Individualism	-6.84(-1.77)			
Uncertainty Aversion	-0.06(-0.16)			
IndProd Gr		0.33(1.34)		
GDP gr		-0.03(-2)		
IndProd/GDP		-0.43(-1.3)		
GDP pc		-7.32(-0.67)		
Credit			-0.06(-0.22)	
MCap			-0.01(-0.06)	
Accounting			0(-0.24)	
Inflation			-5.63(-1.38)	
Rflow			-0.01(-0.29)	
BtoM				7.81(0.16)
PE				3.13(1.76)
CF Vol				-34.1(-0.2)
Firm Size				-16.53(-2.28)
Min Sample Size	32	31	21	35
Max Sample Size	36	36	31	35
Start Date	199501	199501	199501	199501

D.3 Data Cleaning: threshold=3

Table XII Value Premia Across Countries controlling for other factors: Results of Fama-MacBeth Regressions Monthly returns of value minus growth portfolios are regressed on patience, risk aversion and various other explanatory variables, specifically, the individualism index and the uncertainty avoidance index of Hofstede (2001), growth of industrial production (IndProd Gr), growth of gross domestic product (GDP gr), the ratio of industrial production to GDP (IndProd/GDP), per capita gross domestic product (GDP pc), the ratio of total private credit to GDP (Credit), the ratio of total stock market capitalization to GDP (MCap), the accounting standards index (accounting), inflation, an index of restrictions on capital flows (Rflow), country stock market book-to-market ratio (BtoM), country stock market price-earnings ratio (PE), country stock market cash flow growth volatility (CF Vol) and the median firm size in each country (Firm Size). t-statistics, calculated with Newey-West heteroscedasticity and autocorrelation consistent standard errors, are reported in brackets. Min and max sample size for each time period cross-sectional regression are provided in the bottom section along with the start time period for the data sample through December 2011, with the exception of Panel C, as our private credit data are limited to December 2010. Patience and Risk Aversion Proxies are calculated with data cleansing procedure of sensibility criterion on answers of survey subjects to curvature questions as explained in the data section of the paper. The threshold considered here is 3. The insensible subjects are not excluded from patience questions as well.

	Panel A: Behavioral	Panel B: Macro. Dev.	Panel C: Financial Dev.	Panel D Fin. Characteristics
Intercept	2.06(3.43)	2.05(1.89)	2.27(1.69)	1.83(2.74)
Patience	-1.23(-2.09)	-1.28(-2.03)	-1.42(-2.04)	-1.68(-2.2)
Risk Aversion	0.19(2.31)	0.19(2.37)	0.24(2.89)	0.2(2.77)
Individualism	-6.78(-1.74)			
Uncertainty Aversion	-0.05(-0.14)			
IndProd Gr		0.32(1.33)		
GDP gr		-0.03(-2.08)		
IndProd/GDP		-0.4(-1.2)		
GDP pc		-6.38(-0.58)		
Credit			0.01(0.02)	
MCap			-0.06(-0.28)	
Accounting			0(-0.3)	
Inflation			-6.09(-1.5)	
Rflow			-0.02(-0.37)	
BtoM				14.21(0.3)
PE				3.8(2.2)
CF Vol				1.54(0.01)
Firm Size				-15.73(-2.15)
Min Sample Size	32	31	21	35
Max Sample Size	36	36	31	35
Start Date	199501	199501	199501	199501

D.4 Including All Countries - Main Setting of Data Cleaning: threshold=5

Table XIII Value Premia Across Countries controlling for other factors: Results of Fama-MacBeth Regressions Monthly returns of value minus growth portfolios are regressed on patience, risk aversion and various other explanatory variables, specifically, the individualism index and the uncertainty avoidance index of Hofstede (2001), growth of industrial production (IndProd Gr), growth of gross domestic product (GDP gr), the ratio of industrial production to GDP (IndProd/GDP), per capita gross domestic product (GDP pc), the ratio of total private credit to GDP (Credit), the ratio of total stock market capitalization to GDP (MCap), the accounting standards index (accounting), inflation, an index of restrictions on capital flows (Rflow), country stock market book-to-market ratio (BtoM), country stock market price-earnings ratio (PE), country stock market cash flow growth volatility (CF Vol) and the median firm size in each country (Firm Size). t-statistics, calculated with Newey-West heteroscedasticity and autocorrelation consistent standard errors, are reported in brackets. Min and max sample size for each time period cross-sectional regression are provided in the bottom section along with the start time period for the data sample through December 2011, with the exception of Panel C, as our private credit data are limited to December 2010. Patience and Risk Aversion Proxies are calculated with data cleansing procedure of sensibility criterion on answers of survey subjects to curvature questions as explained in the data section of the paper. The threshold considered here is 5. The insensible subjects are not excluded from patience questions as well. Countries with very short time period of data are also included.

	Panel A: Behavioral	Panel B: Macro. Dev.	Panel C: Financial Dev.	Panel D Fin. Characteristics
Intercept	1.97(3.24)	2(1.97)	2(1.47)	1.79(2.57)
Patience	-1.28(-2.21)	-1.19(-1.9)	-1.43(-2.05)	-1.86(-2.41)
Risk Aversion	0.22(2.58)	0.21(2.49)	0.25(2.72)	0.25(3.22)
Individualism	-6.77(-1.64)			
Uncertainty Aversion	0.01(0.01)			
IndProd Gr		0.19(0.8)		
GDP gr		-0.02(-1.55)		
IndProd/GDP		-0.36(-1.1)		
GDP pc		-7.59(-0.74)		
Credit			0.03(0.09)	
MCap			-0.13(-0.62)	
Accounting			0(-0.14)	
Inflation			-6.21(-1.49)	
Rflow			-0.01(-0.3)	
BtoM				28.44(0.54)
PE				4.09(2.01)
CF Vol				18.88(0.11)
Firm Size				-18.23(-2.47)
Min Sample Size	32	31	21	36
Max Sample Size	41	41	32	36
Start Date	199501	199501	199501	199501

D.5 Including All Countries - Data Cleaning: threshold=10

Table XIV Value Premia Across Countries controlling for other factors: Results of Fama-MacBeth Regressions Monthly returns of value minus growth portfolios are regressed on patience, risk aversion and various other explanatory variables, specifically, the individualism index and the uncertainty avoidance index of Hofstede (2001), growth of industrial production (IndProd Gr), growth of gross domestic product (GDP gr), the ratio of industrial production to GDP (IndProd/GDP), per capita gross domestic product (GDP pc), the ratio of total private credit to GDP (Credit), the ratio of total stock market capitalization to GDP (MCap), the accounting standards index (accounting), inflation, an index of restrictions on capital flows (Rflow), country stock market book-to-market ratio (BtoM), country stock market price-earnings ratio (PE), country stock market cash flow growth volatility (CF Vol) and the median firm size in each country (Firm Size). t-statistics, calculated with Newey-West heteroscedasticity and autocorrelation consistent standard errors, are reported in brackets. Min and max sample size for each time period cross-sectional regression are provided in the bottom section along with the start time period for the data sample through December 2011, with the exception of Panel C, as our private credit data are limited to December 2010. Patience and Risk Aversion Proxies are calculated with data cleansing procedure of sensibility criterion on answers of survey subjects to curvature questions as explained in the data section of the paper. The threshold considered here is 10. The insensible subjects are not excluded from patience questions as well. Countries with very short time period of data are also included.

	Panel A: Behavioral	Panel B: Macro. Dev.	Panel C: Financial Dev.	Panel D Fin. Characteristics
Intercept	1.95(3.26)	2.01(1.96)	2.04(1.47)	2(3.03)
Patience	-1.29(-2.14)	-1.11(-1.75)	-1.43(-2.01)	-1.83(-2.35)
Risk Aversion	0.21(2.45)	0.17(2.03)	0.22(2.14)	0.21(2.68)
Individualism	-6.73(-1.65)			
Uncertainty Aversion	-0.01(-0.02)			
IndProd Gr		0.19(0.8)		
GDP gr		-0.02(-1.47)		
IndProd/GDP		-0.37(-1.11)		
GDP pc		-7.99(-0.78)		
Credit			-0.06(-0.22)	
MCap			-0.08(-0.41)	
Accounting			0(-0.11)	
Inflation			-5.78(-1.38)	
Rflow			-0.01(-0.21)	
BtoM				20.81(0.4)
PE				3.43(1.67)
CF Vol				-9.16(-0.05)
Firm Size				-18.6(-2.52)
Min Sample Size	32	31	21	36
Max Sample Size	41	41	32	36
Start Date	199501	199501	199501	199501

Media Coverage, the Cross-Section of Stock Returns and Market States: An International Study

Abstract

Employing data on mass media coverage provided by Bloomberg News Trend, we analyze the relation between mass media coverage and the cross-section of stock returns in 20 financially developed stock markets around the world. We find considerable differences as to the magnitude and direction of this relation across countries. Analyzing the relation of media coverage and stock returns conditional on the market state, we find that in most countries stocks not covered by mass media during bull markets subsequently clearly outperform stocks that are highly covered in bull markets. In bear markets on the other hand, the return differential between stocks not covered by mass media and stocks highly covered by mass media is mostly insignificant or negative. A strategy that goes long (short) stocks not covered and short (long) those highly covered by mass media when the market state is positive (negative), yields a positive return premium in 16 out of 20 countries. This return premium is highly significant and persistent in the countries with the largest stock markets.

KEYWORDS: news effect, media coverage, cross-section of stock returns, market states

1 Introduction

Publicly available news announcements are an important channel for disseminating information to investors. Every day, thousands of articles about companies are published in mass media and processed by investors in order to assess their potential impact on changes in firm values.

By examining whether mass media coverage affects the cross-section of stock returns in the

U.S., Fang and Peress (2009) shed light on an important aspect of the relation between media and stock markets. They count the monthly number of articles published about the stocks in their sample in four influential daily newspapers with nationwide circulation. Based on this number of articles they form three portfolios consisting of stocks that have no-, low- and high-media coverage and evaluate their returns. They find that stocks not covered by mass media earn significantly higher future returns than stocks that are highly covered by mass media, even after controlling for widely accepted risk characteristics. The resulting return premium (called media effect or no-media premium) is of an economically significant magnitude. The media effect is strongest among small illiquid stocks and among stocks with otherwise poor information dissemination. We think that the ability to predict future returns using such a simple measure of news coverage - and hereby completely ignoring the content of the news - is very interesting and worth deepening, especially given that there has been little attempt to quantify the importance of mass media coverage internationally.

In this study, we build on Fang and Peress (2009) and contribute to the literature along four dimensions. First of all, we employ a new measure of mass media coverage, obtained from the Bloomberg News Trend database, also comprising internet news sources. Second, we consider a more recent and longer time period ($1999-2012$ opposed to $1993-2002$) and analyze the media effect for a larger set of U.S. stocks[20]. Using our media coverage measure, we find U.S. results that are qualitatively very similar to those of Fang and Peress (2009). Stocks neglected by mass media earn a statistically significant and economically important return premium compared to stocks highly covered by mass media. For portfolio formation and holding periods beyond a horizon of one month, the media effect we find in the U.S. is even stronger than in Fang and Peress (2009). The effect is strongest among the most illiquid set of stocks.

Third, we expand the analysis to an international level by analyzing the entire stock markets in 19 major European and Asia-Pacific (APAC) countries. We employ 12 years of mass media data on more than $21'000$ companies. This large set of international mass media coverage data allows an extensive investigation of the role of mass media coverage in stock pricing. We find considerable differences as to the magnitude and direction of the media effect in countries outside the U.S. Despite the effect being positive in the majority of countries[21], only seven countries (Hongkong, France, Switzerland, Spain, the Netherlands, Belgium and Austria) display positive no-media premiums that are statistically significant and economically large. In the UK we find a large and significant negative no-media premium; returns monotonically increase with media coverage. Despite these heterogeneous country-results, we show that the positive media effect consistently exists and is particularly strong in most countries among specific subgroups of stocks. Especially among small and illiquid stocks, the media effect seems to be a worldwide

[20] We consider all NYSE and NASDAQ stocks. Fang and Peress (2009) consider all NYSE plus 500 randomly selected NASDAQ stocks.

[21] The effect is positive in 14 out of 20 countries.

phenomenon that is of an economically relevant magnitude. Hence, the role of mass media seems to be very important for these subsets of stocks, which arguably are characterized by rather poor information dissemination.

And fourth, as our main contribution, we relate the media effect to a very simple measure of the state of the market. Defining the market state in a country as good/bullish (bad/bearish) when the fraction of stocks with positive returns in a month is above (below) 50%, we show that in the overwhelming majority of countries, portfolios containing stocks that are not covered by mass media during positive market months subsequently clearly outperform portfolios containing stocks that are highly covered during positive market months. Hence, there is a positive, mostly economically large no-media premium, when we condition on the market state being positive. Conditional on the market state being negative on the other hand, we find much smaller and mostly insignificant or negative no-media premiums. Utilizing this insight, we show that a strategy that goes long stocks not covered and short those highly covered by mass media when the market state is positive, and the opposite when the market state is negative, yields a positive return premium in 16 out of 20 countries. The premiums are mostly statistically significant, especially among the countries with the largest stock market capitalizations in our sample. For these countries, the return premium is significant for holding periods up to 12 months and stable across various subgroups of stocks.

Since the end of the 1990's the relation between media and stock markets has gained progressively more attention among academics and financial professionals. One strand of literature focuses on individual investors and finds that they are more likely to buy stocks that have attracted their attention. Grullon, Kanatas, and Weston (2004) establish that firms with larger advertising expenditures have a larger number of individual and institutional investors and more liquid stocks, because investors are more likely to buy companies they know and the advertising increases investors' familiarity with the company. Meschke (2004) finds that stocks experience a strong market reaction to CEO interviews on CNBC: First a run-up over three days and then a reversal of similar magnitude during the 10 trading days after the interviews. They show that individual investors are net buyers on the interview days, causing the price run-up. Moreover, Frieder and Subrahmanyam (2005) document that individual investors prefer to invest in firms with easily recognized products and strong brand. Barber and Odean (2008) show that individual investors are net buyers of attention-grabbing stocks, such as e.g. stocks in the news. These stocks catch individual investors' attention and determine their choice set. Using the same retail investor trading data as Barber and Odean (2008), Engelberg and Parsons (2011) find that local media coverage increases the trading activity of retail investors and - to the contrary of the findings of Barber and Odean (2008) - that buying, as well as selling activity increases[22].

Tetlock (2011) test whether investors appropriately distinguish between new and stale firm

[22]However, the increase in selling activity is less pronounced relative to the increase in buying activity.

news[23] and concludes that individual investors overreact to stale information, which then leads to return reversals.

A second strand of literature focuses on over-/underreaction to news and - in condensed form - concludes that price signals with (without) concurrent news give rise to continuation (reversal) patterns. Using headline news data from Dow Jones Newswire, Chan (2003) e.g. finds that stocks with low returns and concurrent headline news in a given month display a negative drift for up to 12 months, whereas stocks with low returns and no concurrent headline news in a given month tend to reverse in the subsequent month. Using DJ newswire and Wall Street Journal stories about U.S. firms, Tetlock (2010) tests predictions from a theoretical model in which public news resolves information asymmetries between informed and uninformed traders. As Chan (2003), Tetlock (2010) finds that stock returns reverse only when the initial price move has no concurrent firm news.

Antweiler and Fank (2004) look at a sample of 45 U.S. companies and count messages posted on Internet stock message boards[24] and use linguistic methods to determine the bullishness of messages. They show that stock messages predict volatility at daily frequencies and also within the trading day, but that their effect on returns is economically very small. Tetlock (2007) and Tetlock, Saar-Tschansky, and Macskassy (2008) also analyze the qualitative verbal content of mass media articles about specific companies. Tetlock (2007) shows that high media pessimism predicts downward pressure on aggregate market prices and a subsequent reversal and that unusually high/low media pessimism leads to temporarily high market trading volume. Tetlock, Saar-Tschansky, and Macskassy (2008) find that the fraction of negative words used in firm-specific news articles predicts firm earnings in the next quarter negatively.

The rest of the paper is organized as follows: We review the literature implying testable hypotheses with respect to the relation of mass media coverage and the cross-section of stock returns in Section 2. In Section 3 we explain our methodology and describe our data. Section 4 contains our results. In Subsections 4.1 for the U.S., and 4.2 internationally, we discuss results from forming portfolios based on our media coverage measure. The media premium conditional on market states is analyzed in Subsection 4.3. Section 5 eventually concludes. Additional results and details are presented in the Appendix.

2 Hypotheses Development

In this part of the article we develop hypotheses concerning the relation of mass media coverage and stock returns. In Section 2.1 we discuss hypotheses regarding the unconditional relation

[23]Tetlock (2011) defines staleness of news in terms of textual similarity to previous stories about the firm.
[24]Yahoo!Finance and Raging Bull

of mass media coverage and the cross-section of stock returns. Section 2.2 contains hypotheses suggesting the relation of media coverage and stock returns to depend on market states.

2.1 Media Effect on Cross-Section of Stock Returns

The Efficient Market Hypothesis (EMH) in its' semi-strong form posits that it should not be possible to earn abnormal returns by trading based on publicly available information. According to the EMH prices react rapidly to new information and almost instantaneously fully reflect all publicly available information. Hence, there is no role for media coverage (which represents publicly available, stale information) within the framework of the EMH.

Hypothesis 1 (H1)**.** *News coverage has no effects on cross-section of stock returns.*

Nevertheless, there are rational frameworks that exhibit channels through which media coverage could affect future stock returns. One such framework is the "investor recognition hypothesis" of Merton (1987). The model assumes a two-period economy in which investors are not aware of all securities. He argues that investors may follow and invest in only a subset of all listed stocks because of many reasons(Merton, 1987)[25]. As a consequence, each agents only invest in a subset of stocks they are aware of, are hence imperfectly diversified and require a premium for bearing idiosyncratic risk. The model implies a shadow cost of not knowing a stock that depends on the shareholder base, relative market size and idiosyncratic volatility[26]. This shadow cost - ceteris paribus - implies higher current prices and lower future expected returns on stocks with a larger investor base (higher investor recognition)[27]. Hence, in such an economy, stocks with lower investor recognition yield a return premium relative to stocks with higher investor recognition. As Fang and Peress (2009) argues, when we consider that mass media coverage may induce higher investor recognition, stocks highly covered by mass media can be expected to earn lower future returns than those neglected by mass media. Hence, as in Fang and Peress (2009), we hypothesize that no-news coverage may lead to a premium.

Hypothesis 2 (H2)**.** *No-media coverage stocks relative to high-media coverage stocks is expected to yield a positive return premium on average.*

Other frameworks that hint a role for media coverage are rooted in the large body of literature that aims at modeling information asymmetries in financial markets. In these models, some

[25]One argument is that it is possible that investors may incur a set-up cost to be able to process all the detailed information about the firm. In the Merton (1987) model, this set-up cost channel is not explicitly modeled, but serves as a qualitative motivation for why investors only know about subsets of companies.

[26]Shadow cost of not knowing a stock results from the Kuhn-Tucker condition of no investment in that particular stock(Merton, 1987).

[27]The marginal absolute effect of the investor base on this return premium increases with idiosyncratic volatility and relative firm size. For stocks with low idiosyncratic volatility and/or relative size, the marginal effect of the investor base can be very small.

portion of investors trade based on private information, while the others only trade after the news becomes public. Along these lines, e.g. Tetlock (2010) argues that the dissemination of public news can affect stock returns as it supports the resolution of private information. Tetlock (2010) models a three-period economy with two groups of investors. In period 1, informed investors observe a private signal and trade on it. A good (bad) signal yields positive (negative) returns in period 1. In period 2, public news reveals the signal to uninformed investors and they trade on it, resulting in positive (negative) return continuation after a good (bad) signal. This return continuation implies higher autoregressive return predictability following news events. Tetlock (2010) also argues that for stocks without news coverage there is no resolution of private information and hence they are more likely to exhibit reversal[28]. Moreover, the model implies that after the private news get resolved through public news, the impact of news on the prices reduces and it is expected that continuation diminishes over time. If one proxies the unobservable good/bad private signals - as Tetlock (2010) in the empirical part does - by positive/negative realized returns, this implies that winning (losing) stocks with concurrent news are expected to continue winning (losing), whereas winning (losing) stocks without media coverage are more likely to reverse.

Hypothesis 3 (H3)**.** *Winner (loser) stocks with no-media coverage relative to winner (loser) stocks with high-media coverage is expected to yield a negative (positive) return premium.*

Both, Tetlock (2010) and Chan (2003) provide empirical evidence supporting this prediction[29]: They find that stock returns reverse only when the initial price move has no concurrent firm news, and that there is a drift if there is accompanying news. Most importantly with respect to our study, Chan (2003) finds that stocks with low returns and concurrent headline news in a given month display a negative drift for up to 12 months, whereas stocks with low returns without concurrent headline news in a given month tend to reverse in the subsequent month. For stocks with high returns and concurrent news, he finds less drift.

As Fang and Peress (2009) already addressed, this effect may interact with the standard news coverage effect on the cross section of stock returns. In this case, a long-short strategy with no-news vs. high news coverage is equivalent to buying no-news stocks and shorting news stocks, and given the reversal among no-news stocks (losers in particular) and drift among news stocks (losers in particular). Such a strategy would generate a positive alpha, consistent with our results. Since the reversal and drift effects documented in Chan (2003) are concentrated among losers, there is a concern that our results represent the same drift/reversal patterns. If winning (losing) stocks with concurrent news continue winning (losing) and winning/losing

[28]Due to the low autoregressive return predictability generally observed in stock returns.

[29]Chan (2003) has no formal model. He relates his findings to the under-/overreaction hypothesis of Jagadeesh and Titman (1993) and interprets them to mean that investors underreact to public news, resulting in a drift and overreact to price movements unaccompanied by news (spurious price movements), resulting in a reversal.

stocks without media coverage reverse, and if the effect among losers is stronger than among winners, this can yield positive return differentials between no-media versus high-media coverage stocks.

Hypothesis 4 (H4). *The stock returns patterns with losers being stronger than among winners yield positive return premium between no-media versus high-media coverage stocks.*

Finally, the findings by Barber and Odean (2008), Engelberg and Parsons (2011) and others, reviewed in the introduction, suggest that individual investors exhibit behavioral biases and direct their attention to stocks that are in the media. If individual investors are net-buyers of stocks that are in the news, hereby as Barber, Odean, and Zhu (2009) show, temporarily inflating these stock's prices, which then leads to a subsequent reversal, then we would also expect a positive return differential between stocks with no-media coverage and stocks with high-media coverage. This return differential should then be largely driven by the low (negative) returns on high coverage stocks.

2.2 Media Effect Conditional on the Market States

The key argument/channel needed to derive from the Merton (1987) model the hypothesis that no-media coverage stocks should on average outperform high-media coverage stocks, is that mass media coverage reaches many investors that are not current shareholders and induces some of these investors to incur the set-up costs to follow the firm and to eventually become new shareholders. Now, despite mass media coverage reaching many investors that are not current shareholders during good, as well as during bad market conditions, we think it is reasonable/intuitive to posit that during bad market conditions, this coverage induces less investors to actually incur the set-up costs to follow the firm and even fewer of them to actually become new shareholders. First of all, worse economic conditions may reduce the willingness of investors to incur any (set-up) costs. Secondly, firm news are presumably rather bad on average during bad market conditions, hereby reducing the incentive to eventually become a new shareholder.

Hypothesis 5 (H5). *The no-media premium is significantly more pronounced during good market states compared to the premiums during bad market states.*

Merton (1987) points out that a proper consideration of the channel from high mass media coverage to an increase in shareholder base requires a dynamic version of his model. And he also explicates how such a model could look. Citing Merton (1987), *p*.500: "In such a model, current (informed) shareholders of firm k would have expectations about the future time path of the shareholder base. If a favorable story implies an upward revision in those anticipations, then the price should rise immediately, ... Similarly, an unfavorable story implying a reduction in the anticipated growth in the investor base should cause an immediate price decline.“ Given that firm news are good (bad) on average during good (bad) market conditions, the dynamic model that Merton sketches also implies that a larger no-media premium should be expected during good market conditions.

As mentioned, the set-up cost channel is not explicitly modeled in the Merton (1987) model, but serves as a motivation for why investors only know about subsets of companies. But also strictly within the Merton (1987) framework, one can identify channels that suggest a larger no-media premium in good market conditions. Concretely, the equilibrium aggregate shadow cost (λ_k) of not knowing stock k depends, inter alia, on the expected risk-adjusted excess return over the single factor[30]. This shadow cost, which is measured in units of expected return, can be interpreted as the opportunity cost of not investing in stock k. When there is an external shock that reduces the risk adjusted expected excess returns for reasons other than an increase in investor recognition q_k, this will reduce the shadow cost, and hence the effect of the investor base on stock returns will decrease. If such a negative shock[31] is more likely to occur during bad market conditions, then this also suggests that a larger no-media premium should be expected during good market conditions.

Furthermore, it can be shown that the sensitivity of expected returns with respect to changes in the investor base increases when the expected firm cash-flows increase. This is a feature that is more likely to occur during good market conditions, hereby suggesting a larger no-media premium in good market states.

And yet another channel that suggests a larger no-media premium in good market conditions could proceed via idiosyncratic volatility. Xu and Malkiel (2003) show that cross-sectionally, companies with high expected earnings growth exhibit higher idiosyncratic volatility. In the Merton (1987) model, the effect of changes in the investor base on return premiums increases with idiosyncratic volatility. Assuming a higher percentage of firms with high expected earnings growth during good market states then implies that a larger no-media premium should be expected during good market conditions.

The hypothesis (*H5*) deducted from Merton (1987) is at odds with the likely implications of the asymmetric information model of Tetlock (2010) and the findings of Chan (2003), when we reconsider their findings in the context of good/bad market states. If there are proportionally more winners (losers) in good (bad) market states, the continuation and reversal patterns of winners (losers) are expected to dominate (in terms of magnitude and/or significance), and this will result in a negative return (positive) differential for no-news versus high-news stocks in good

[30]Formally, $\lambda_k = (1 - q_k)(\bar{R}_k - R - b_k(\bar{R}_{n+1} - R))$, where $\bar{R}_k$, $\bar{R}_{n+1}$, and R denote expected returns on the asset k, on the common factor asset, and on the riskless asset, respectively. q_k denotes the fraction of all investors who know about security k.

[31]E.g. a decrease in expected returns for the stock, increased uncertainty in a market pushing expected market premiums upward and/or increased market risk exposure possibly associated firms' leverage effects in downturns.

(bad) market states. [32]. This is exactly the opposite of what we deduced in the framework of Merton (1987).

Hypothesis 6 (H6). *A negative return (positive) differential for no-news versus high-news stocks in good (bad) market states*

Changing no-media premiums conditional on the state of the market would imply that unconditional no-media premiums cannot be of similar magnitudes in different markets, unless these markets go through similar patterns of good/bad market conditions. Hence, we expect that depending on the heterogeneity of the occurrence of good/bad market states across countries during our sample period, we will find heterogeneous unconditional no-media premiums across different stock markets.

3 Data and Methodology

3.1 Methodology

To evaluate whether there is a systematic return differential between stocks with no- and high-media coverage (*H1* vs. *H2*), we follow the methodology of Fang and Peress (2009). At the end of each month we split our universe of investable stocks in a specific country into three portfolios. The first one (called the no-media coverage portfolio) consists of all the stocks without media coverage (no articles in the Bloomberg News Trend database) during the month. The second portfolio contains the stocks with low-media coverage and the third portfolio the stocks with high-media coverage during the month. To differentiate between low and high coverage stocks we follow Fang and Peress (2009) and use the median number of articles on all stocks that have media coverage in that month. We perform this analysis with media coverage measured over periods ranging from 1 to 12 months (portfolio formation periods). We then calculate equally-weighted returns on the three portfolios over the subsequent 1 to 12 months (portfolio holding periods)[33]. To examine the existence of a return premium for no-coverage stocks, we construct a zero-investment portfolio that goes long the no-media coverage portfolio and short the high-media coverage portfolio. The resulting time-series of monthly zero-investment portfolio returns is then evaluated against the CAPM, the Fama-French and the Carhart factors. We denote the return premiums resulting from this exercise as our unconditional results. They are presented in Section 4.1 for the U.S. and in Section 4.2.1 for the remaining countries.

[32]These conjecture only holds if the differences in absolute magnitude of the effects among winners/losers are not too pronounced.

[33]Fang and Peress (2009) and Chan (2003) also use equally-weighted returns, among others. As e.g. Fang and Peress (2009), Chan (2003) or Fama (1998) we use the overlapping portfolio approach of Jagadeesh and Titman (1993) to calculate the returns.

To find out whether our unconditional results are possibly driven by the effects in Chan (2003) and Tetlock (2010), we first examine the no-media premium within terciles of stocks formed according to current month returns in Section 4.2.2. This allows us to analyze if the media effects among winner and loser stocks are consistent with the implications stated in Chan (2003) and Tetlock (2010) (*H3*). For the countries in which this is the case, we then check whether the corresponding continuation/reversal patterns potentially cause the unconditional results we find (*H4*).

We also analyze whether there are subgroups of stocks for which the media effect is pronounced and robust across countries. To do so, we first sort all stocks into terciles according to firm characteristics (such as e.g. market capitalization) at the end of each month. Within each of the resulting terciles, we form our usual no-, low- and high-media coverage portfolios and calculate the subsequent returns of the media based long-short strategy. The resulting monthly returns are evaluated against the risk factors. These are our conditional results. They can be found in Section 4.2.3.

The main focus of this article is on the relation between media coverage and the cross-section of stock returns conditional on the state of the market. We consider the market state in a given month and country to be good/bullish (bad/bearish), if the percentage of stocks with positive (negative) returns during that month exceeds 50%. This simple measure of market states focuses on financial market performance rather than market conditions from a general macro-economic perspective. We believe that this provides a more up-to-date/real-time measure of the (perceived) current market state compared to a measure based on slow-changing overall economic conditions[34]. In order to evaluate the relation of media coverage and the cross-section of stock returns conditional on the state of the market, we first analyze the no- versus high-coverage strategy returns separately following good and bad market conditions. Then we apply our simple market state measure as a (out-of-sample) signal on the original long-short strategy. Instead of always being long no-coverage stocks and and short high coverage stocks, we reverse the long- and short-positions by taking a long position on high media coverage stocks and a short position on no-media coverage stocks if the market state is bad at the time we form the portfolios. As for the pure no-high coverage strategy, we evaluate the resulting time-series of monthly strategy returns against the CAPM, the Fama-French and the Carhart factors. The corresponding results are summarized in Section 4.3.

[34]Moreover, we avoid problems that may arise when using market returns to proxy the state of the market (as e.g. Cooper, Gutierrez, and Hameed, 2004). Such a measure may indicates positive market states when a few shares outperform drastically, even though a large proportion of the market is subject to losses. Nevertheless, for robustness we also report results based on this measure in the Online Appendix. The results are qualitatively very similar.

3.2 Data

Our sample consists of all common stocks listed on the main local exchanges of 20 developed countries at some point in time from December 1999 to December 2012. We only consider primary listings of common stocks. Besides the U.S. market, where we consider all stocks listed on NYSE and NASDAQ, we collect individual equity data of 14 major European and five major Asian countries' stock markets.[35]

Stock returns, prices, market capitalization, trading volume and accounting data are from Bloomberg (BB). All our returns and results reported are in terms of U.S. Dollars. Risk factors (market, size, value, momentum) and risk-free rates for the US and Japan are from Kenneth French's Data Library[36]. Risk factors for the European and APAC countries are either from the CCRS-DBF Risk Factor Database[37] from the Institute of Banking and Finance at the University of Zurich or from Stefano Marmi's Data Library[38]. For Belgium, Denmark, Finland, Greece and New Zealand we could not find publicly available risk factors. In these cases we use the respective regional factors from Kenneth French's Data Library.

Fang and Peress (2009) use the LexisNexis[39] database to get data on a stock's media exposure. They proxy a stock's media coverage by the number of articles published about the stock during a certain month in four major U.S. daily newspapers[40] with nationwide circulation. In order to get this data for each company, the keywords associated with the company name have to be obtained and searched manually in the desired sources. A lot of company names are nomenclatures of localities (e.g. Genolier or Flughafen Zurich) or common names (e.g. Siegfried Holding or Walter Meier AG). This observation, as well as the fact that some companies change their names during the course of our sample period complicates the search for articles about a particular company. This implies that the searches have to be done very carefully and that the plausibility of the search results needs to be checked extensively for every single company. Hence, gathering these media coverage data and verifying their plausibility and reliability is a very time-consuming task, which requires a high degree of knowledge about the country, it's stock market and media scene. Given that we have a sample of more than 21′000 companies[41] from 20 countries, this is not a viable way to pursue for us. Instead, we employ "Story Count" data from Bloomberg's News

[35] The countries considered are the same as in Fama and French (2012). The European countries we consider are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Netherlands, Norway, Spain, Sweden, Switzerland and the United Kingdom. These are the largest markets in Europe by market capitalization. See e.g. http://www.quandl.com/economics/stock-market-capitalization-all-countries. From Asia we have Japan and the APAC countries Australia, Hong Kong, New Zealand and Singapore.

[36] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

[37] http://www.bf.uzh.ch/cms/publications/risk-factor-database_168_1633.html. For details see Schmidt, Arx, Wagner, and Ziegler (2011).

[38] http://homepage.sns.it/marmi/Data_Library.html♯datalibrary.

[39] Dow Jones Factiva is an alternative database for the same purpose.

[40] New York Times, USA Today, Wall Street Journal and Washington Post.

[41] Fang and Peress (2009) have a total of about 2000 companies in their sample.

Trend database to get information on a stock's exposure to mass media. Bloomberg's News Trend database collects all articles published in far more than a hundred "top publications globally, which are relevant to financial professionals". These publications not only comprise important national newspapers[42] from all over the world, but also newswires/news tickers and internet sources. The firms can conveniently be identified by their ISIN-number or Bloomberg-ticker and, as in LexisNexis or Factica, it is possible to choose between different levels of "relevance"[43] (high, medium, low) that an article has for the company at hand. Hence, we proxy a stock's monthly media coverage by the number of highly relevant articles that we find in the Bloomberg News Trend database about the stock during a particular month.

Of course, our measure of media coverage differs to some extent from a media coverage measure which is solely based on articles published in printed national newspapers as in Fang and Peress (2009). But given the fact that national newspapers from all over the world are an important element of the Bloomberg News Trend database, we expect the two measures to be highly correlated[44]. In order to get an idea about how closely our media coverage measure is related to a measure based on newspaper articles alone, we use the Dow Jones Factiva[45] archive to collect all articles published in seven major Swiss newspapers[46] about 317 Swiss stocks[47] during $2000-2009$. We use the data to form a media coverage measure in the spirit of Fang and Peress (2009) (number of articles published about each company in each month). We then compare this measure to our Bloomberg Story Count based media coverage. As can be seen in Figure 2 in the Appendix, the correlation between the two measures is indeed reasonably high.

Table I presents summary statistics on our media coverage data across countries. The first column shows the total number of stocks that we consider over the entire sample period for all the countries in our sample. We cover a total of 21′611 companies. Column two contains the average fraction of stocks covered by media (stocks with at least one article) each month. This fraction is highest in the U.S. and, with 67%, of a similar magnitude as the fraction of U.S. stocks covered by the newspaper-based media coverage measure in Fang and Peress (2009) (on average 70% of stocks covered in a year), again indicating that our measure is a good proxy of overall media coverage[48]. For the vast majority of countries, the average fraction of stocks covered each month is in the reasonable range between 30% and 60%. Columns three and four (five and six) provide the mean and median number of articles per month for all stocks (for all

[42]As e.g. Wall Street Journal for the U.S. or Neue Zuercher Zeitung for Switzerland.
[43]Relevance in terms of the match of article content and company.
[44]Taking into account the increasing emergence of the internet as an important news source during our sample period, we consider it to be reasonable to also include such sources when calculating measures of media coverage.
[45]http://www.dowjones.com/factiva/sources.asp.
[46]Tages Anzeiger, Neue Zuercher Zeitung, Basler Zeitung, Handelszeitung, Finanz und Wirtschaft, Le Temps and Sonntagszeitung. These newspapers account for about 30% of the daily newspaper circulation in Switzerland.
[47]All stocks that were part of the Swiss Performance Index during $2000-2009$.
[48]The same is true for Switzerland if we compare the newspaper-based measure to the Bloomberg Story Count based coverage measure.

stocks that have coverage in a given month). The mean is clearly higher than the median in all cases, indicating that media coverage is skewed in all countries.

Table I. **Media Coverage Data - Summary Statistics**. This table contains summary statistics on the media coverage data across countries. The total number of stocks considered in each country is given in column one. Column two contains the average of the monthly fraction of stocks with at least one article. Columns three and four (five and six) provide the mean and median number of articles per month for all stocks (for all stocks that have coverage in a given month).

Countries	Total # of stocks	Fraction of Stocks Covered	Mean # articles Total Sample	Median # articles Total Sample	Mean # articles Stocks Covered	Median # articles Stocks Covered
USA	3778	0.67	16	4	22	8
Austria	159	0.38	5	0	13	7
Belgium	252	0.41	5	0	12	6
Denmark	289	0.33	3	0	8	4
Finland	151	0.52	6	2	11	4
France	1366	0.29	5	0	17	4
Germany	1614	0.24	4	0	18	4
Greece	376	0.25	3	0	13	4
Italy	355	0.49	9	0	18	4
Netherlands	214	0.56	12	2	21	6
Norway	339	0.5	5	1	9	4
Spain	221	0.49	9	1	18	6
Sweden	683	0.38	3	0	8	3
Switzerland	317	0.47	9	0	19	5
UK	3072	0.37	5	0	12	3
Japan	4016	0.51	5	1	10	3
Australia	2217	0.26	2	0	10	4
Hong Kong	1299	0.31	3	0	11	4
New Zealand	182	0.34	3	0	8	4
Singapore	711	0.32	3	0	9	3
All	21611	0.4	5.8	0.55	13	4.5

To evaluate whether there is a significant return differential between stocks covered and stocks not covered by mass media in a specific country, we follow the approach of Fang and Peress (2009) and form portfolios based on our media coverage measure. We exclude stocks with prices in the fifth price percentile at the end of each month in each country. We do this to exclude stocks with low prices, so-called penny stocks, to make sure that our results are not driven by small illiquid stocks. In the literature, there neither seems to be a clear definition of a penny stock[49], nor a consistent common methodology for price screening. While some studies exclude stocks

[49]E.g. Harris (1994) argues that penny stocks are defined by the SEC as stocks with prices below one dollar and that those have different minimum price variation limitations. Until 2001, the minimum price variation for stocks with prices lower than \$1 was \$1/16, since then it is \$0.0001. This lessens bid-ask bounce and trading cost related issues for these stocks drastically. See e.g. He (2013).

with prices lower than five dollars[50], others exclude stocks below one dollar or two dollars[51], and some others do not apply any price screening at all[52]. During our sample period, the percentage of all NYSE and NASDAQ stocks having prices below one (five) dollars in a given month ranges from 1% to 9% (10% to 37%). The proportion of low priced stocks is much larger during the burst of dot-com bubble in the beginning of the last decade and extremely magnified during the recent financial crisis $2007-2009$. However, a large proportion of the stocks having low prices during these periods cannot be regarded as penny stocks[53]. They are simply low priced stocks, but with sufficient liquidity and no trade limitations are imposed on them. Excluding stocks below five dollars implies the omission of a very large portion of the stock market, especially during turbulent times. We believe that adopting a five dollar price screening may introduce a strong bias in our sample of stocks over time, omitting relevant information for the present study.

Furthermore, we require stocks to be actively traded during the portfolio formation month and to have price and market capitalization data in order to be included in our sample. We exclude returns above 500% and below -95% per month to avoid unrealistically high/low returns, possibly caused by database errors, driving our results.

In Table II we present summary statistics for our market state measure. Column one displays the average fraction of stocks with positive monthly returns over our sample period for each country. Column two shows the percentage of good market state months over the entire sample period. For both measures, we observe quite some heterogeneity across countries. The U.S., Belgium and Switzerland for example have a relatively high fraction of good market condition months (more than 50%), whereas in countries as the UK or Germany this fraction is below 30%. Column three contains the average market return over the entire sample period, columns four and five (six and seven) the average monthly market return and standard deviation during good (bad) market months. Table II demonstrates that our market state measure captures high (low) average market returns during good (bad) market states. During good market state months, equally weighted market portfolios yield highly significant positive return on average, whereas during the bad market state months, equally weighted market portfolios yield highly significant negative average returns.

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[50]E.g. Amihud (2002).

[51]See e.g. Cooper, Gutierrez, and Hameed (2004), Kothari, Lewellen, and Warner (2006) and Lakonishok and Lee (2001).

[52]See e.g. Fama and French (2012) or Chordia and Shivakumar (2002).

[53]E.g. Citigroup during 2009 traded well below $5.

Table II. Market State Measure - Summary Statistics. The market state is considered to be good/bullish (bad/bearish) in a given month if the fraction of stocks with positive (negative) returns exceeds 50%. Equally weighted monthly market returns over the entire sample period and equally weighted monthly market returns and standard deviations during good, as well as during bad market state months are tabulated.

Countries	Average Fraction of Stocks w Positive Ret.	Fraction of Good State Months	Total Market Return	Equally Weighted Market Average Return and Volatility			
				Good States		**Bad States**	
				Mean	Std. Dev.	Mean	Std. Dev.
USA	0.52	0.57	0.0122**	0.0505***	0.035	-0.0395***	0.044
UK	0.41	0.26	0.0013	0.0554***	0.039	-0.0176***	0.041
Japan	0.47	0.45	0.0041	0.0491***	0.027	-0.0329***	0.033
Australia	0.44	0.38	0.0109*	0.0734***	0.041	-0.0275***	0.054
Hongkong	0.43	0.35	0.0153**	0.0973***	0.064	-0.0286***	0.062
New Zealand	0.48	0.54	0.0080***	0.0342***	0.021	-0.0222***	0.026
Singapore	0.44	0.4	0.0075	0.0736***	0.056	-0.0366***	0.052
Austria	0.47	0.41	0.0083**	0.0374***	0.028	-0.0122***	0.037
Belgium	0.5	0.55	0.0066**	0.0266***	0.02	-0.0182***	0.034
Denmark	0.48	0.5	0.0059	0.0414***	0.026	-0.0291***	0.039
Finland	0.49	0.51	0.0076*	0.0490***	0.039	-0.0354***	0.036
France	0.48	0.5	0.0083**	0.0436***	0.027	-0.0275***	0.038
Germany	0.43	0.28	0.0045	0.0556***	0.026	-0.0158***	0.041
Greece	0.39	0.3	-0.0099	0.0933***	0.074	-0.0549***	0.069
Italy	0.46	0.47	-0.0008	0.0448***	0.033	-0.0413***	0.043
Netherlands	0.49	0.5	0.0053	0.0452***	0.034	-0.0351***	0.046
Norway	0.47	0.46	0.0080	0.0593***	0.034	-0.0366***	0.053
Spain	0.48	0.48	0.0049	0.0458***	0.03	-0.0325***	0.036
Sweden	0.46	0.42	0.0046	0.0638***	0.044	-0.0381***	0.044
Switzerland	0.5	0.54	0.0044	0.0350***	0.023	-0.0319***	0.038

Belgium and Switzerland for example have a relatively high fraction of good market condition months (more than 50%), whereas in countries as the UK or Germany this fraction is below 30%. Column three contains the average market return over the entire sample period, columns four and five (six and seven) the average monthly market return and standard deviation during good (bad) market months. Table II demonstrates that our market state measure captures high (low) average market returns during good (bad) market states. During good market state months, equally weighted market portfolios yield highly significant positive return on average, whereas during the bad market state months, equally weighted market portfolios yield highly significant negative average returns.

4 Results

We present our results in three sections. In the first Section 4.1, we focus on the U.S. and investigate whether the media effect that Fang and Peress (2009) found is still valid during our more recent sample period and using our media coverage measure. In Section 4.2, we present international evidence on the existence of no-media premiums. We examine whether the media effect that we find in the U.S. is an internationally observable phenomenon. Finally, we analyze the media effect conditional on the market state. The corresponding results across countries are presented in Section 4.3.

4.1 The Media Premium in the U.S.

The media effect we find in the U.S. (see Panel A of Table III) for the time period 1999 – 2012 is comparable, both in terms of magnitude and significance, to what Fang and Peress (2009) found for their 1993 – 2002 sample period. For a formation and holding period equal to one month, the average returns on stocks with no, low and high coverage are 1.36%, 1.20% and 0.92% per month compared to 1.35%, 1.11% and 0.96% in Fang and Peress (2009). The return differential between the portfolio of stocks with no- and the portfolio of stocks with high-media coverage is statistically significant and economically meaningful and amounts to 0.45% per month (compared to 0.39% per month in Fang and Peress (2009)). This return difference cannot be fully explained by commonly used risk factors. Although adding the factors absorbs about a third of the return differential - it decreases from 0.45% to 0.32% per month after controlling for market, size, book-to-market and momentum factors - the resulting CAPM-, Fama-French-, as well as Carhart-alphas remain statistically significant[54] and with about 3.84% per annum also economically important.

The first three columns of Panel A in Table III show that not only stocks with no-media coverage, but also stocks with low- and high-media coverage exhibit significantly positive alphas on average. Moreover, the alphas decrease monotonically as media coverage increases. These two observations indicate that that the observed media effect mainly comes from the portfolio consisting of stocks, which are not covered by mass media. As Fang and Peress (2009) point out, this suggests that the observed media effect is unlikely to be related to findings of e.g. Barber and Odean (2008) that individual investors tend to buy attention-grabbing stocks. If this was the cause of the findings, we would expect the media effect to be driven by negative subsequent returns on stocks with high-media coverage.

In a next step we investigate the persistence of the no-media premium for longer portfolio formation and holding horizons. To do so, we form portfolios based on media coverage over 1 to 12 month periods (portfolio formation periods) and hold them for holding periods ranging from 1 to 12 months. Panel B in Table III depicts time-series means, CAPM-, Fama-French- and Carhart-alphas for the zero-investment strategy that goes long no-coverage stocks and short high-coverage stocks at the different portfolio formation and holding periods. The results illustrate that the media effect persists far beyond the one month formation and holding period horizon. The no-media premium becomes more stable and stronger as we increase the formation period

[54]Two-sided p-values are 1.38%, 5.80% and 5.95%, respectively.

Table III. Media Premiums in the U.S. Market. **Panel A** reports the profitability of equally weighted portfolios formed according to media coverage. At the end of each month t, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The portfolios are held during month $t+1$ and rebalanced monthly. No-High (Low-High) represents a zero-investment portfolio long stocks with No (Low) media coverage and short stocks with High media coverage. Time-series means plus alpha estimates from regressing the resulting monthly excess returns on the No, Low and High portfolios and returns on the long-short portfolios on widely accepted risk factors are presented. **Panel B** reports the returns on a zero-investment portfolio that goes long stocks with No media coverage over the last k months and short stocks with High media coverage over the last k months (formation period), with $k = 1, 3, 6, 9, 12$. The portfolios are held from t to $t + k$, with $k = 1, 3, 6, 9, 12$ months (holding period). We use the overlapping portfolio approach of Jagadeesh and Titman (1993) to calculate the returns. Time-series means plus alpha estimates resulting from regressing the monthly long-short portfolio returns on widely accepted risk factors are reported. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Panel A: Returns on Media Portfolios					
Regression Model	No	Low	High	No-High	Low-High
TS Mean	0.0136	0.0120	0.0092	0.0045**	0.0028**
CAPM Alpha	0.0108***	0.0089***	0.0060***	0.0048**	0.0029***
FF Alpha	0.0066***	0.0051***	0.0034**	0.0032*	0.0017*
Carhart Alpha	0.0068***	0.0052***	0.0036***	0.0032*	0.0016*

Panel B: Longer Formation and Holding Periods				
Holding Period	TS Mean	CAPM Alpha	FF Alpha	Carhart Alpha
Panel B.1: Formation Period = 1 Month				
1 month	0.0045**	0.0048**	0.0032*	0.0032*
3 months	0.0047**	0.0051***	0.0036**	0.0035**
6 months	0.0043**	0.0046**	0.0032**	0.0032**
9 months	0.0043**	0.0046**	0.0032**	0.0032**
12 months	0.0041**	0.0044**	0.0030**	0.0030*
Panel B.2: Formation Period = 3 Months				
1 month	0.0051*	0.0057**	0.0053**	0.0052**
3 months	0.0044*	0.0050**	0.0045**	0.0044**
6 months	0.0041	0.0047*	0.0042*	0.0042*
9 months	0.0038	0.0043*	0.0040*	0.0039*
12 months	0.0035	0.0040*	0.0036*	0.0036*
Panel B.3: Formation Period = 6 Months				
1 month	0.0057*	0.0066***	0.0061***	0.0061***
3 months	0.0054*	0.0063**	0.0057**	0.0057**
6 months	0.0052*	0.0061**	0.0057**	0.0056**
9 months	0.0049*	0.0057**	0.0053**	0.0053**
12 months	0.0044	0.0052**	0.0047**	0.0046**
Panel B.4: Formation Period = 9 Months				
1 month	0.0074**	0.0080***	0.0078***	0.0078***
3 months	0.0064**	0.0070***	0.0067***	0.0067***
6 months	0.0057**	0.0063**	0.0061***	0.0061***
9 months	0.0054*	0.0060**	0.0057**	0.0056**
12 months	0.0051*	0.0056**	0.0052**	0.0052**
Panel B.5: Formation Period = 12 Months				
1 month	0.0071**	0.0086***	0.0083***	0.0083***
3 months	0.0059*	0.0073***	0.0070***	0.0069***
6 months	0.0055*	0.0069***	0.0065***	0.0064***
9 months	0.0050*	0.0063**	0.0059***	0.0058**
12 months	0.0048*	0.0060**	0.0056**	0.0055**

and it remains highly statistically significant at all considered holding horizons[55].

[55]The effects are considerably stronger, both in terms of magnitude and significance, than the corresponding long-term results in Fang and Peress (2009).

Table IV. Conditional Media Premiums in the U.S. Market. This table reports the profitability of equally weighted No minus High media coverage (No-High) portfolio returns for subgroups of stocks. At the end of each month t we first sort all stocks into terciles according to firm characteristics. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The portfolios are held during month $t + 1$ and rebalanced monthly. Time-series means plus alpha estimates from regressing the monthly returns on the No-High portfolio on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Tercile	TS Mean	CAPM Alpha	FF Alpha	Carhart Alpha
		Panel 1: By MV		
1	-0.0017	-0.0011	-0.0007	-0.0011
2	-0.0044*	-0.0040*	-0.0049**	-0.0050***
3	0.0018	0.0020	0.0010	0.0008
		Panel 2: By MTBVyearly		
1	0.0026	0.0031	0.0036	0.0034
2	0.0008	0.0010	0.0002	0.0001
3	0.0027	0.0027	0.0011	0.0011
		Panel 3: By RETpastyear		
1	0.0018	0.0023	0.0005	0.0002
2	0.0027	0.0029	0.0009	0.0008
3	0.0101***	0.0103***	0.0094***	0.0095***
		Panel 4: By RETcurrentmonth		
1	0.0110***	0.0114***	0.0104***	0.0103***
2	0.0026	0.0029	0.0008	0.0008
3	-0.0007	-0.0004	-0.0020	-0.0021
		Panel 5: By Pavgpast		
1	0.0023	0.0030	0.0035	0.0031
2	-0.0012	-0.0007	-0.0020	-0.0022
3	0.0033*	0.0035**	0.0014	0.0013
		Panel 6: By BidAskSpread		
1	0.0036	0.0039*	0.0002	0.0000
2	0.0041*	0.0042*	0.0032	0.0031
3	0.0042	0.0045*	0.0048*	0.0046*
		Panel 7: By VAavgpastyear		
1	-0.0030	-0.0027	-0.0017	-0.0017
2	-0.0037**	-0.0036**	-0.0031**	-0.0031**
3	0.0013	0.0011	0.0017	0.0017
		Panel 8: By Amihud		
1	0.0029*	0.0030**	0.0024*	0.0024*
2	-0.0038*	-0.0036**	-0.0038**	-0.0037**
3	-0.0015	-0.0011	0.0002	0.0005

In Table IV[56] we investigate whether the media effect in the U.S. is stable when sorting with respect to various company characteristics and whether it is related to a lack of liquidity[57]. To do so, we first sort all stocks into terciles according to firm characteristics. Within each of the resulting terciles, we form our usual no-, low- and high-media coverage portfolios and calculate the subsequent returns on the media based long-short strategy. The resulting returns

[56]The results in Table IV are for formation and holding periods of one month.

[57]We proxy the degree of liquidity of the stocks in our sample using four measures: Price, Amihud's illiquidity ratio, bid-ask spread and trading volume. As Fang and Peress (2009) point out, the media effect could represent an arbitrage opportunity, which persists because large impediments prevent rational investors from trading it. If this is true, the the media effect should be strongest among the most illiquid stocks.

are evaluated against the risk factors.

In terms of magnitude, we find the media effect to be stronger among large companies (Panel 1), companies that have a low market-to-book value (Panel 2), and among high momentum-stocks (Panel 3). The results for our illiquidity measures (Panels $5-8$) are inconclusive. The sorts by price and bid-ask spread indicate that the media effect is strongest among rather illiquid stocks, whereas sorts by trading volume and Amihud's illiquidity ratio suggest the opposite.

As in Fang and Peress (2009), Panel 4 of Table IV shows that the no-media premium is large and significant among stocks that have low current month returns and (insignificant) negative among stocks with high current month returns. This seems to be in line with continuation/reversal patterns among winner and loser stocks (*H3*) and raises the concern that our unconditional results could be rooted in these patterns (as formulated in *H4*). Yet, also among the set of stocks with low current month returns[58], we observe significant positive Carhart-alphas on the portfolio containing stocks with high media coverage and on the portfolio without media coverage. Hence, losing stocks with concurrent news do not continue losing and there is also no evidence for a short-term reversal of losing stocks without news coverage. This is not consistent with the continuation/reversal patterns among loser stocks that form the basis of what *H3* predicts and thus provides evidence against our results being rooted in these effects.

Overall, the media effect in the U.S. does not seem to be very stable across subsamples of firm characteristics. For the entire cross-section of U.S. stocks on the other hand, it seems to be a very stable phenomenon that is of an economically important magnitude and that exists across a wide range of alternative time horizons and that seems in line with *H2*.

4.2 International Media Premiums

In this paragraph, we analyze international no-media premiums across countries. In Section 4.2.1 we present unconditional results. We attempt to identify countries exhibiting a significant media effect. If the conclusion of Fang and Peress (2009) that the no-media premiums represent a compensation for holding stocks with low investor recognition is true, we should observe the effects found in the U.S. in different markets as well. In Section 4.2.2 we investigate whether our unconditional results are driven by the continuation/reversal patterns found in Chan (2003) and Tetlock (2010). In Section 4.2.3 we adopt a firm characteristics based conditional perspective in order to find out whether there are particular subgroups of stocks for which the media effect is very pronounced and systematic across countries.

[58] See Panel 1 in Table XI in the Appendix.

4.2.1 Unconditional Media Premiums across Countries

Table V presents returns on portfolios sorted according to media coverage in the 20 countries in our sample over the entire sample period 1999 to 2012. The results are for a portfolio formation and holding period equal to one month. The first three columns of the table contain time-series means and factor alphas for the three portfolios with no-, low- and high-media coverage. Column four contains the same information for the zero-investment strategy being long the no-coverage and short the high-coverage stocks, column five the results for the strategy that longs the low-coverage and shorts the high-coverage companies. We focus on the no-high coverage strategy throughout this paper. Results for portfolio formation and holding periods beyond one month are contained in Section C in the Appendix.

Table V shows that for 14 countries the return differential between stocks with no- and stocks with high-media coverage is positive[59], ranging from statistically significant and economically meaningful 0.95% per month (about 11% p.a.) in Hongkong, to statistically insignificant and economically negligible 0.02% per month in Sweden. In addition to the U.S., the return differentials are significantly positive after controlling for risk factors in Hongkong, Germany, France, Switzerland, Spain, the Netherlands, Belgium and Austria. For the remaining six countries, namely New Zealand, Singapore, the UK, Italy, Denmark and Greece, we find a negative media effect. The UK (with -0.47% per month) is the only country with a significant negative effect.

Panels $7-20$ in Table V contain unconditional results for the 14 European countries in our sample. In France, Switzerland, Spain, the Netherlands, Belgium and Austria (and to some degree Germany) the return differentials between stocks without media coverage and those with high media coverage in a given month are positive, economically meaningful and statistically highly significant[60] after controlling for all risk factors.

The first three columns of the respective Panels in Table V reveal that mainly the long legs of the strategy (the no-coverage stocks) exhibit significantly positive alphas. This suggests that, as in the U.S., the observed media effect for these European countries primarily stems from the portfolios consisting of stocks that are not covered by mass media.

With the exception of France[61] and Spain, the media effect extends to formation and holding periods beyond the one month horizon (see Tables X in Section C in the Appendix), though by far not as consistently as in the U.S. Still, the fact that the media effect mainly comes from the long leg of our strategy, combined with the observation that the effect is not short-lived, provides a first indication for that our results are unlikely to be related to the continuation/reversal

[59] For the USA, Australia, Hongkong, Japan, Germany, France, Switzerland, Spain, Sweden, Netherlands, Belgium, Norway, Finland and Austria.

[60] Two-sided p-values for the alphas are all below 5%.

[61] In France we observe the media effect only at the 1-month holding horizon, but at all portfolio formation horizons.

patterns modeled in Tetlock (2010) and found in Chan (2003).

The media effect we find in the largest European stock market, the UK, is negative. As can be seen in Table X in Section C in the Appendix, we observe a highly significant negative media effect at most portfolio formation and holding periods that we consider, implying that the

Table V. Media Premiums Across Countries. This table reports the profitability of equally weighted portfolios formed according to media coverage. At the end of each month t, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The portfolios are held during month $t+1$ and rebalanced monthly. No-High (Low-High) represents a zero-investment portfolio long stocks with No (Low) media coverage and short stocks with High media coverage. Time-series means plus alpha estimates from regressing the resulting monthly excess returns on the No, Low and High portfolios and returns on the long-short portfolios on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Regression Model	No	Low	High	No-High	Low-High
		Panel 1 : USA			
TS Mean	0.0136	0.0120	0.0092	0.0045**	0.0028**
CAPM Alpha	0.0108***	0.0089***	0.0060***	0.0048**	0.0029***
FF Alpha	0.0066***	0.0051***	0.0034**	0.0032*	0.0017*
Carhart Alpha	0.0068***	0.0052***	0.0036***	0.0032*	0.0016*
		Panel 2 : Australia			
TS Mean	0.0180	0.0153	0.0125	0.0055	0.0028
CAPM Alpha	0.0156	0.0128	0.0101	0.0054	0.0027
FF Alpha	0.0199**	0.0186**	0.0162**	0.0037	0.0024
Carhart Alpha	0.0295***	0.0281***	0.0243***	0.0052*	0.0038
		Panel 3 : Hongkong			
TS Mean	0.0172	0.0115	0.0077	0.0095**	0.0038
CAPM Alpha	0.0080	0.0013	-0.0026	0.0107**	0.0040
FF Alpha	0.0018	-0.0058***	-0.0069***	0.0086***	0.0011
Carhart Alpha	0.0017	-0.0051**	-0.0054**	0.0071***	0.0003
		Panel 4 : Japan			
TS Mean	0.0065	0.0058	0.0044	0.0021	0.0014
CAPM Alpha	0.0069**	0.0063**	0.0051***	0.0018	0.0012
FF Alpha	0.0024**	0.0020**	0.0017*	0.0007	0.0003
Carhart Alpha	0.0023**	0.0019**	0.0016**	0.0007	0.0003
		Panel 5 : NewZealand			
TS Mean	0.0127	0.0170	0.0156	-0.0030	0.0013
CAPM Alpha	0.0050	0.0088**	0.0077	-0.0027	0.0011
FF Alpha	0.0056	0.0098**	0.0090	-0.0034	0.0008
Carhart Alpha	0.0064*	0.0096**	0.0093	-0.0029	0.0003
		Panel 6 : Singapore			
TS Mean	0.0102	0.0086	0.0123	-0.0021	-0.0037*
CAPM Alpha	0.0012	-0.0003	0.0037**	-0.0024	-0.0040*
FF Alpha	-0.0002	-0.0017	0.0015	-0.0017	-0.0031
Carhart Alpha	0.0004	-0.0016	0.0018	-0.0013	-0.0034
		Panel 7 : UK			
TS Mean	0.0001	0.0033	0.0047	-0.0047**	-0.0014
CAPM Alpha	-0.0032	-0.0001	0.0012	-0.0044**	-0.0013
FF Alpha	0.0042	0.0075	0.0076	-0.0034*	-0.0001
Carhart Alpha	0.0102*	0.0134**	0.0129***	-0.0028	0.0004
		Panel 8 : Germany			
TS Mean	0.0093	0.0013	0.0020	0.0073**	-0.0007
CAPM Alpha	0.0082	0.0003	0.0010	0.0072***	-0.0007
FF Alpha	0.0135*	0.0077	0.0082	0.0053*	-0.0005
Carhart Alpha	0.0209***	0.0177***	0.0178***	0.0031	-0.0001

Table V. Media Premiums Across Countries. - Continued

Regression Model	No	Low	High	No-High	Low-High
Panel 9 : France					
TS Mean	0.0131	0.0057	0.0058	0.0074**	-0.0001
CAPM Alpha	0.0124	0.0053	0.0057	0.0067***	-0.0004
FF Alpha	0.0175***	0.0110*	0.0119**	0.0056***	-0.0009
Carhart Alpha	0.0191***	0.0129**	0.0136***	0.0056***	-0.0007
Panel 10 : Switzerland					
TS Mean	0.0093	0.0092	0.0042	0.0051*	0.0049**
CAPM Alpha	0.0108	0.0109	0.0062	0.0046**	0.0047**
FF Alpha	0.0121**	0.0127**	0.0077	0.0044**	0.0050***
Carhart Alpha	0.0150***	0.0160***	0.0113**	0.0038**	0.0047**
Panel 11 : Spain					
TS Mean	0.0087	0.0083	0.0035	0.0052	0.0048*
CAPM Alpha	0.0048	0.0034	-0.0015	0.0063**	0.0049**
FF Alpha	0.0044	0.0038	-0.0020	0.0063***	0.0057***
Carhart Alpha	0.0061**	0.0063***	-0.0001	0.0062**	0.0064***
Panel 12 : Sweden					
TS Mean	0.0070	0.0050	0.0068	0.0002	-0.0017
CAPM Alpha	0.0055	0.0034	0.0050	0.0005	-0.0016
FF Alpha	0.0098	0.0079	0.0073	0.0024	0.0005
Carhart Alpha	0.0142*	0.0113	0.0115	0.0028	-0.0002
Panel 13 : Netherlands					
TS Mean	0.0106	0.0032	0.0039	0.0067**	-0.0006
CAPM Alpha	0.0068**	-0.0005	-0.0001	0.0069***	-0.0004
FF Alpha	0.0061**	-0.0012	0.0002	0.0060**	-0.0014
Carhart Alpha	0.0061**	-0.0013	0.0002	0.0059**	-0.0014
Panel 14 : Belgium					
TS Mean	0.0131	0.0074	0.0042	0.0089***	0.0032
CAPM Alpha	0.0097***	0.0034*	-0.0002	0.0100***	0.0036*
FF Alpha	0.0070***	0.0004	-0.0028	0.0098***	0.0032
Carhart Alpha	0.0065***	0.0006	-0.0021	0.0086***	0.0027
Panel 15 : Norway					
TS Mean	0.0112	0.0101	0.0068	0.0043	0.0033
CAPM Alpha	0.0009	-0.0011	-0.0058*	0.0067*	0.0047
FF Alpha	0.0003	-0.0017	-0.0058*	0.0061*	0.0042
Carhart Alpha	0.0020	0.0011	-0.0039	0.0059	0.0050
Panel 16 : Italy					
TS Mean	0.0004	0.0011	0.0010	-0.0007	0.0001
CAPM Alpha	0.0010	0.0021	0.0026	-0.0015	-0.0004
FF Alpha	0.0015	0.0023	0.0018	-0.0003	0.0004
Carhart Alpha	0.0058	0.0060	0.0054	0.0004	0.0006
Panel 17 : Finland					
TS Mean	0.0104	0.0074	0.0052	0.0052	0.0022
CAPM Alpha	0.0063*	0.0030	0.0004	0.0059**	0.0026
FF Alpha	0.0056**	0.0015	-0.0000	0.0056*	0.0015
Carhart Alpha	0.0046*	0.0017	0.0010	0.0036	0.0008
Panel 18 : Austria					
TS Mean	0.0124	0.0090	0.0080	0.0044	0.0011
CAPM Alpha	0.0063**	0.0010	-0.0016	0.0079**	0.0026
FF Alpha	0.0059**	0.0007	-0.0017	0.0077**	0.0024
Carhart Alpha	0.0064**	0.0014	-0.0010	0.0074**	0.0024
Panel 19 : Denmark					
TS Mean	0.0084	0.0058	0.0119	-0.0035	-0.0062
CAPM Alpha	0.0046	0.0018	0.0072*	-0.0027	-0.0055
FF Alpha	0.0007	-0.0011	0.0062	-0.0055	-0.0074**
Carhart Alpha	-0.0000	-0.0008	0.0070	-0.0071*	-0.0078**
Panel 20 : Greece					
TS Mean	-0.0062	-0.0081	-0.0040	-0.0022	-0.0041
CAPM Alpha	-0.0108*	-0.0135**	-0.0097*	-0.0012	-0.0039
FF Alpha	-0.0153**	-0.0186***	-0.0153***	-0.0000	-0.0033
Carhart Alpha	-0.0110	-0.0148**	-0.0116*	0.0006	-0.0032

negative media effect we find for the cross-section of stocks in the UK is not only a short-term phenomenon but robust across alternative horizons. Panel 7 of Table V shows that, opposed to the aforementioned countries, the returns on our three media portfolios monotonically increase with the degree of media coverage. Stocks with a high media coverage outperform those neglected by mass media, implying that the negative media effect we observe in the UK mainly comes from the high returns on the short leg of our strategy.

Panels 2 to 6 of Table V show the results for Japan and the APAC countries in our sample. The only country with a significant media effect in this group is Hongkong, with a positive time-series mean of 0.95% per month and an economically meaningful and highly significant alpha of 0.71% per month after controlling for market, size, book-to-market and momentum factors. Examining the alphas of the individual portfolios indicates that - in contrast to the European countries with a positive effect - the effect seems to mainly come from shorting stocks with high media coverage, which yield negative returns on average[62]. As Table X in the Appendix shows, the significant positive media effect in Hongkong persists at all holding and formation periods that we consider.

Overall, the results presented in this section suggest that there are considerable differences as to the magnitude, direction and persistence of the media effect across countries. We do not find consistent evidence for the existence of premiums that compensate investors for holding stocks with low investor recognition in all countries. We have a significant positive effect in seven countries and a significant negative effect in the UK. Hence, the media effect patterns verified in the U.S. do not seem to be a consistent and wide-spread property of the cross-section of stock returns in developed markets. Nevertheless, as we will show in the next paragraphs, there are subgroups of stocks among which the media effect seems to be a stable property that can be observed in most developed markets.

4.2.2 Media Premiums and Continuation/Reversal Patterns

Results on the media premiums within portfolios of stocks sorted with respect to current month return terciles are displayed in Table VI and provide a consistent pattern: All countries in our sample, with the exception of the UK, provide an economically large positive no-media premium among the low current month return tercile stocks. The effect is statistically significant in 16 out of 20 countries[63]. On the other hand, stocks with high current month returns display a negative no-media premium in 18 out of 20 countries[64], but only eight[65] countries' stock markets result

[62]This is also true at longer holding and formation horizons and is hence consistent with the negative return drift of "news losers" found in Chan (2003).
[63]Not significant positive in the UK, Spain, Denmark and Greece.
[64]Hongkong and Spain are the exceptions with a positive effect.
[65]Australia, Japan, New Zealand, Singapore, Spain, Sweden, Finland and Denmark.

in significantly negative no-media premiums after controlling for risk factors. These patterns seem to be in line with the implications of the asymmetric information model in Tetlock (2010) and the findings of Chan (2003) outlined in Section 2.1 (H3). A look at Tables XI and XII in the Appendix however reveals that this is actually the case only for a few countries. Tables XI and XII contain details on current month loser and current month winner portfolios in all countries, for holding periods from 1 to 12 months. Carhart-alphas on the portfolios with no- and high-media coverage are displayed in columns two and three, the no-high Carhart-alphas are in the last column.

According to Table XI, only Hongkong, Singapore, the Netherlands, Belgium, Norway, Finland and Austria actually display return patterns among loser stocks that are broadly consistent with what reversal/continuation patterns[66] imply. Nevertheless, this raises the concern that the significant positive unconditional no-media premiums we find in Hongkong, the Netherlands, Belgium and Austria could in fact be driven by the current month losers' media effect, as formulated in *H4*.

From Section 4.2.1 we know that the unconditional media effect in Hongkong is positive and highly significant at all considered portfolio holding and formation periods and driven by the negative returns on high coverage stocks: The Carhart-alpha on the high-coverage portfolio is significantly negative and large, while the positive Carhart-alpha on the no-coverage portfolio is not significantly different from zero. Combined with the fact that the Carhart-alpha on the high-coverage portfolio in the low current month return tercile (Panel 3 of Table XI) is significantly negative at all horizons, this indicates that it is possible that the positive unconditional media effect in Hongkong is in fact driven by the negative drift of "news-losers" in the sense of *H4*.

In the Netherlands and Austria, the significant positive unconditional media effect reported in Section 4.2.1 is persistent as well, and clearly driven by the positive returns on no-coverage stocks: The Carhart-alpha on the no-coverage portfolio is large and significantly positive in both countries, while the Carhart-alpha on the high-coverage portfolio is very small and positive in the Netherlands and slightly negative in Austria (in both cases not significantly different from zero). Hence, the positive unconditional media effect is not likely to come from the negative drift on "news losers"[67]. It is as well unlikely that the positive unconditional media effect stems from a positive (short-term) reversal of "no-news losers": In the Netherlands, the alphas on the no-coverage portfolio in the low current month return tercile are not statistically different from zero at all considered horizons (see Table XI), while the unconditional media effect is significant for holding horizons up to three months. In Austria the unconditional media effect is significant positive at all holding and formation horizons, while the reversal of "no-news losers" is only

[66]Positive returns on no-coverage stocks (resulting from a short-term reversal) and negative returns on high-coverage stocks (resulting from a negative continuation/drift).

[67]Besides, the alphas on the high-coverage portfolio in the low current month return tercile are not statistically different from zero in the Netherlands at all considered horizons (see Table XI).

short-lived.

The significant positive unconditional media effect in Belgium is as well driven by the large

Table VI. Media Premiums Conditional on Current Month Returns. This table reports the profitability of equally weighted No minus High media coverage (No-High) portfolio returns for subgroups of stocks sorted according to current month returns. At the end of each month t we first sort all stocks into terciles according to their returns during month t. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The portfolios are held during month $t+1$ and rebalanced monthly. Time-series means plus alpha estimates from regressing the monthly returns on the No-High portfolio on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Media Coverage	No-High		
RET current month	Low	Med	High
	Panel 1 : USA		
TS Mean	0.0110***	0.0026	-0.0007
CAPM Alpha	0.0114***	0.0029	-0.0004
FF Alpha	0.0104***	0.0008	-0.0020
CAR Alpha	0.0103***	0.0008	-0.0021
	Panel 2 : Australia		
TS Mean	0.0290***	0.0005	-0.0090**
CAPM Alpha	0.0288***	0.0005	-0.0090**
FF Alpha	0.0271***	-0.0010	-0.0109***
CAR Alpha	0.0280***	0.0001	-0.0091***
	Panel 3 : Hongkong		
TS Mean	0.0165***	0.0039	0.0081
CAPM Alpha	0.0176***	0.0051	0.0089
FF Alpha	0.0155***	0.0036	0.0057
CAR Alpha	0.0142***	0.0023	0.0034
	Panel 4 : Japan		
TS Mean	0.0070***	0.0015	-0.0034*
CAPM Alpha	0.0067***	0.0012	-0.0036*
FF Alpha	0.0050***	0.0008	-0.0041**
CAR Alpha	0.0050***	0.0009	-0.0041**
	Panel 5 : NewZealand		
TS Mean	0.0143**	-0.0119	-0.0133***
CAPM Alpha	0.0141**	-0.0114	-0.0129***
FF Alpha	0.0175***	-0.0139	-0.0159***
CAR Alpha	0.0201***	-0.0130	-0.0156***
	Panel 6 : Singapore		
TS Mean	0.0102***	-0.0017	-0.0148***
CAPM Alpha	0.0095**	-0.0014	-0.0149***
FF Alpha	0.0114***	-0.0011	-0.0162***
CAR Alpha	0.0120***	0.0001	-0.0163***
	Panel 7 : UK		
TS Mean	-0.0005	-0.0082***	-0.0030
CAPM Alpha	-0.0002	-0.0079***	-0.0028
FF Alpha	0.0016	-0.0068***	-0.0029
CAR Alpha	0.0022	-0.0062***	-0.0021
	Panel 8 : Germany		
TS Mean	0.0231***	0.0009	-0.0023
CAPM Alpha	0.0231***	0.0008	-0.0024
FF Alpha	0.0218***	-0.0009	-0.0040
CAR Alpha	0.0192***	-0.0034	-0.0046
	Panel 9 : France		
TS Mean	0.0193***	0.0039	-0.0010
CAPM Alpha	0.0187***	0.0033*	-0.0015
FF Alpha	0.0178***	0.0019	-0.0024
CAR Alpha	0.0176***	0.0024	-0.0023

Table VI. Media Premiums Conditional on Current Month Returns - Continued

Media Coverage	No-High		
RET current month	Low	Med	High
	Panel 10 : Switzerland		
TS Mean	0.0082**	0.0020	-0.0010
CAPM Alpha	0.0078**	0.0017	-0.0014
FF Alpha	0.0077**	0.0015	-0.0019
CAR Alpha	0.0070**	0.0010	-0.0024
	Panel 11 : Spain		
TS Mean	0.0048	0.0007	0.0072*
CAPM Alpha	0.0049	0.0020	0.0080**
FF Alpha	0.0051	0.0024	0.0075**
CAR Alpha	0.0040	0.0032	0.0073**
	Panel 12 : Sweden		
TS Mean	0.0109**	0.0002	-0.0111**
CAPM Alpha	0.0112***	0.0005	-0.0108**
FF Alpha	0.0127***	0.0016	-0.0091**
CAR Alpha	0.0142***	0.0016	-0.0085*
	Panel 13 : Netherlands		
TS Mean	0.0122**	0.0116***	-0.0024
CAPM Alpha	0.0118**	0.0127***	-0.0015
FF Alpha	0.0110**	0.0124***	-0.0021
CAR Alpha	0.0108**	0.0124***	-0.0021
	Panel 14 : Belgium		
TS Mean	0.0205***	0.0068**	-0.0039
CAPM Alpha	0.0216***	0.0075**	-0.0029
FF Alpha	0.0213***	0.0057*	-0.0021
CAR Alpha	0.0192***	0.0061*	-0.0033
	Panel 15 : Norway		
TS Mean	0.0221***	-0.0028	-0.0080*
CAPM Alpha	0.0246**	0.0002	-0.0062
FF Alpha	0.0232**	-0.0002	-0.0066
CAR Alpha	0.0205**	0.0010	-0.0075*
	Panel 16 : Italy		
TS Mean	0.0034	-0.0018	-0.0045
CAPM Alpha	0.0028	-0.0024	-0.0055
FF Alpha	0.0055*	-0.0017	-0.0052
CAR Alpha	0.0062*	-0.0015	-0.0046
	Panel 17 : Finland		
TS Mean	0.0157***	0.0069*	-0.0087*
CAPM Alpha	0.0163***	0.0076**	-0.0084**
FF Alpha	0.0186***	0.0073**	-0.0092**
CAR Alpha	0.0159***	0.0064*	-0.0123***
	Panel 18 : Austria		
TS Mean	0.0235***	0.0003	-0.0058
CAPM Alpha	0.0277***	0.0030	-0.0048
FF Alpha	0.0277***	0.0035	-0.0055
CAR Alpha	0.0270***	0.0035	-0.0056
	Panel 19 : Denmark		
TS Mean	0.0058	-0.0038	-0.0154***
CAPM Alpha	0.0066	-0.0031	-0.0149***
FF Alpha	0.0051	-0.0025	-0.0163***
CAR Alpha	0.0027	-0.0042	-0.0167***
	Panel 20 : Greece		
TS Mean	0.0092	-0.0030	-0.0064
CAPM Alpha	0.0103	-0.0024	-0.0056
FF Alpha	0.0127*	-0.0028	-0.0056
CAR Alpha	0.0106	-0.0007	-0.0042

positive returns on no-coverage stocks: The Carhart-alpha on the no-coverage portfolio is large and significantly positive, the Carhart-alpha on the high-coverage portfolio is negative (but not significantly different from zero). The latter observation implies that, as above, the positive unconditional media effect cannot be explained by the negative drift on "news losers". According to Panel 14 of Table XI, the Carhart-alphas on the no-media portfolio in the low current month return tercile are significantly positive in the short-run. As the unconditional media effect in Belgium is likewise just detectable in the short-run and mainly comes from the large positive returns on no-coverage stocks, this suggests that the positive unconditional media effect in Belgium may stem from the positive (short-term) reversal of "no-news losers".

From the eight countries seemingly in line with reversal/continuation effects among winners, only Japan, New Zealand, Singapore, Finland and Denmark actually display return patterns among winner stocks that are broadly consistent with reversal/continuation patterns[68]. Hence, it is possible that the reversal/continuation effects among winners are the reason for why we do not find significant positive unconditional no-media premiums in these countries.

Singapore and Finland are the only countries exhibiting return patterns that are consistent with continuation/reversal among winners as well as among losers (see Panels 6 and 17 in Tables XI and XII, respectively). Whereas in Finland the positive media effect among losers is stronger in absolute terms than the negative media effect among winners, the opposite applies to Singapore. Hence, if the stocks contained in the unconditional no-coverage portfolios correspond to no-news stocks (losers and winners) and those in the unconditional high-coverage portfolio correspond to news stocks (losers and winners), we would expect to find an unconditional media effect that is weakly positive in Finland and weakly negative in Singapore. And this is what we actually find in Section 4.2.1[69].

In Japan, New Zealand and Denmark we only find return patterns consistent with continuation/reversal among current month winners, resulting in a negative media effect among current month winners (see Table XII). The could partly explain why we do not find significant positive no-media premiums in these countries.

Overall, although we observe significantly positive no-media premiums for current month losers across most countries, the significant positive unconditional no-media premiums that we find do not seem to be caused by return continuation/reversal effects. Only in Hongkong, and to a smaller degree in Belgium, the significant positive return differential between no- and high coverage stocks could in fact be rooted in continuation/reversal patterns as documented in Chan (2003) and modeled in Tetlock (2010).

[68]Negative returns on no-coverage stocks (resulting from a short-term reversal) and positive returns on high-coverage stocks (resulting from a positive continuation/drift).

[69]In Finland we have an insignificant positive unconditional media effect, that is driven by the significantly positive Carhart-alpha on the no-coverage portfolio, while the Carhart-alpha on the high-coverage portfolio is not significantly different from zero. In Singapore we see an insignificant negative unconditional effect. Carhart-alphas on no- and high-coverage portfolios are positive though not significantly different from zero, but the alpha on high-coverage portfolio is of a larger magnitude.

4.2.3 Media Premiums Conditional on Firm Characteristics

Tables presenting the double-sort results can be found in Section E in the Appendix. They contain time-series means and risk-adjusted returns (alphas) on the no-high media coverage zero-investment portfolios for terciles of stocks, formed using the respective firm characteristics.

Results for the portfolios of stocks sorted with respect to market capitalization are presented in Table **??** in the Appendix. They show that most stock markets provide a positive no-media premium among small cap stocks. The only exceptions are the U.S. and Denmark with insignificant negative premiums. New Zealand, Singapore, the U.K., Germany, France, the Netherlands, Austria and Greece provide a statistically significant and large positive no-media premium among small caps after controlling for all risk factors. Interestingly, even for countries yielding a negative no-media premium in the entire cross-section (the U.K., Italy, Greece, Singapore and New Zealand) we find a positive - for the UK, Greece and New Zealand yet statistically highly significant - no-media premium among the stocks in the lowest size tercile. Among large cap stocks on the other hand there is no significant positive media effect in any country.

Looking at our sorts with respect to measures that proxy for iliquidity (Tables XIV to XVII in the Appendix), the most consistent results are found among stocks with high bid-ask spreads. The portfolios consisting of stocks located in the highest bid-ask spread tercile exhibit a positive no-media premium in all countries in our sample. In the U.S., Hong Kong, Japan, New Zealand, the UK, Germany, France, Switzerland, Spain, Belgium, Norway and Austria the effect is statistically highly significant and of a large magnitude. Taken as a whole across all our illiquidity proxies, all countries but Singapore, Italy, Finland, Denmark and Greece display a significant positive media effect in at least one of the most illiquid terciles. Finland, Australia, Hongkong, Japan, Singapore, Germany and Austria display significant negative no-media premiums among the most liquid stocks.

High past year return stocks, for most stock markets (16 out of 20) yield a positive no-media premium[70]. In the U.S., Hong Kong, Japan, New Zealand, the UK, France, Switzerland, Spain, the Netherlands, Belgium, Austria the effect is highly significant. The returns on the no-, low- and high-media coverage portfolios are monotonically decreasing as the coverage increases and the long-short return differential is generally driven by the long leg containing the no-media coverage stocks. Hence, high momentum stocks with high mass media coverage in a given month underperform those without media coverage. For past year losers, the effect is also predominantly positive (in 17 out of the 20 countries), but only in seven countries significantly so. See Table XVIII in the Appendix.

Among the countries where we have significant positive unconditional no-media premiums

[70]The negative effect in the remaining four countries is insignificant.

(Hongkong, France, Switzerland, Spain, the Netherlands, Belgium and Austria), the media effect is in general positive and stable across firm characteristic terciles. The effect is always strongest among small companies and by trend more pronounced among past year winner stocks and more illiquid stocks. Nevertheless, all but Austria also display significant positive no-media premiums among more liquid stocks with a low or medium bid-ask spread. Moreover, we find significant positive no-media premiums for all of these countries (but Hongkong) among stocks in the highest price tercile. Thus, the positive unconditional media effect we find in these countries is not only prevalent among the most illiquid stocks.

The negative unconditional media effect in the UK is not stable when analyzed across firm characteristics. Although the effect remains negative in most double-sort terciles, it switches sign and becomes positive - consistent with what we observe in the other countries - among small stocks, past winner stocks and among the most illiquid stocks.

Overall, examining the conditional results we observe a considerable tendency in most stock markets towards smaller and more illiquid stocks providing a significant positive no-media premium. Independently on whether the unconditional media effect in a country is positive or negative, for these subgroups the effect consistently points into the same direction in the vast majority of countries. Hence, the role of mass media seems to be more important for these subsets of stocks, that are possibly characterized by otherwise rather poor information dissemination.

4.3 Market-States and Media Premiums

We introduce a simple measure to determine whether the market conditions are good or bad and analyze whether there are systematic differences in the media effect when we condition on this measure. We consider the market state[71] in a given month to be good/bullish (bad/bearish), if the percentage of stocks with positive (negative) returns during that month exceeds 50%.

Table VII provides evidence, indicating a notable degree of asymmetry in the media effect. The first two columns contain the average market conditions over our sample period and the fraction of months with good market conditions for all countries in our sample. The U.S. is the only country in which the market state is positive on average. In the last five columns of Table VII we summarize the returns of our media coverage based long-short strategy, conditional on market conditions. As can be seen in column three, across all countries, stocks with high-media coverage have significantly higher concurrent returns than stocks not covered by mass media during good market months. During bad market state months, the picture is not so clear-cut. Column five shows that in half of the countries stocks without coverage during bad market

[71]Results for using positive/negative equally-weighted market returns to approximate good/bad market conditions are contained in the Online Appendix. The results are qualitatively very similar.

Table VII. **Market States and Media Premiums - Summary Statistics**. At the end of each month t, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. We form a zero-investment portfolio long stocks with No media coverage and short stocks with High media coverage. The portfolio is held during month $t+1$ and rebalanced monthly. The market state in a given month is considered good/bullish (bad/bearish), if the percentage of stocks with positive (negative) returns during that month exceeds 50%. The resulting average month t (current returns) and month $t+1$ zero-investment returns (subsequent returns) conditional on good/bad market states are reported. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Countries	Average Fraction of Stocks w Positive Ret.	Fraction of Good State Months	Average Return No-High Coverage Zero-Investment Portfolio Good State Months		Bad State Months		Return Difference Good vs. Bad States
			Current	Subsequent	Current	Subsequent	Subsequent
USA	0.52	0.57	-0.0173***	0.0100***	0.0099***	-0.0030	0.0130***
UK	0.41	0.26	-0.0342***	0.0074	-0.0227***	-0.0090***	0.0163***
Japan	0.47	0.45	-0.0201***	0.0053**	-0.0044**	-0.0005	0.0058**
Australia	0.44	0.38	-0.0172**	0.0242***	-0.0242***	-0.0057	0.0299***
Hongkong	0.43	0.35	-0.0182**	0.0313***	-0.0168***	-0.0021	0.0334***
New Zealand	0.48	0.54	-0.0225***	0.0064**	-0.0034	-0.0138**	0.0202***
Singapore	0.44	0.4	-0.0139***	0.0042	-0.0211***	-0.0064*	0.0106**
Austria	0.47	0.41	-0.0252***	0.0040	0.0217***	0.0048	-0.0007
Belgium	0.5	0.55	-0.0222***	0.0079**	0.0203***	0.0102*	-0.0023
Denmark	0.48	0.5	-0.0246***	-0.0025	0.0030	-0.0045	0.0020
Finland	0.49	0.51	-0.0146***	0.0049	0.0109***	0.0056	-0.0007
France	0.48	0.5	-0.0196***	0.0145***	0.0158***	0.0004	0.0141***
Germany	0.43	0.28	-0.0310***	0.0139***	0.0065	0.0046	0.0093
Greece	0.39	0.3	-0.0054	-0.0033	-0.0116*	-0.0017	-0.0016
Italy	0.46	0.47	-0.0278***	0.0021	-0.0011	-0.0031	0.0052
Netherlands	0.49	0.5	-0.0266***	0.0100***	0.0147***	0.0032	0.0068
Norway	0.47	0.46	-0.0429***	0.0067	0.0046	0.0022	0.0045
Spain	0.48	0.48	-0.0301***	0.0106***	0.0107***	0.0001	0.0106*
Sweden	0.46	0.42	-0.0382***	0.0086*	-0.0091**	-0.0058*	0.0144**
Switzerland	0.5	0.54	-0.0230***	0.0090**	0.0204***	0.0003	0.0086

months outperform those with high coverage.

More importantly, in all countries but Greece and Denmark, portfolios containing stocks that are not covered by mass media during positive market state months subsequently clearly outperform portfolios containing stocks that are highly covered during positive market months. This can be seen in column four of Table VII. There is a positive, mostly economically large no-media premium in 18 out of the 20 markets[72] in our sample, when we condition on the market conditions being positive.

[72]Significant positive in 12 countries: Japan, Australia, New Zealand, Germany, Sweden plus in the countries that exhibit a significant positive unconditional no-media effect (the U.S., Hongkong, Austria, Belgium, France, the Netherlands, Spain, Switzerland).

On the other hand, only one country (Belgium) displays a significant positive media effect when we condition on negative market states (column six of Table VII). In the UK, New Zealand, Singapore and Sweden we find significant negative no-media premiums; stocks highly covered by mass media during negative market condition months subsequently outperform those not covered by media during bad market months. In the remaining countries, the return differential between no- and high-media coverage stocks is not statistically different from zero, often has a negative prefix, and in case it is positive, is of a much smaller magnitude than after good market months[73]. The last column of Table VII contains the differences in average returns of the No-High media coverage zero-investment strategy between good and bad market state months. The differences are statistically significant in ten countries.

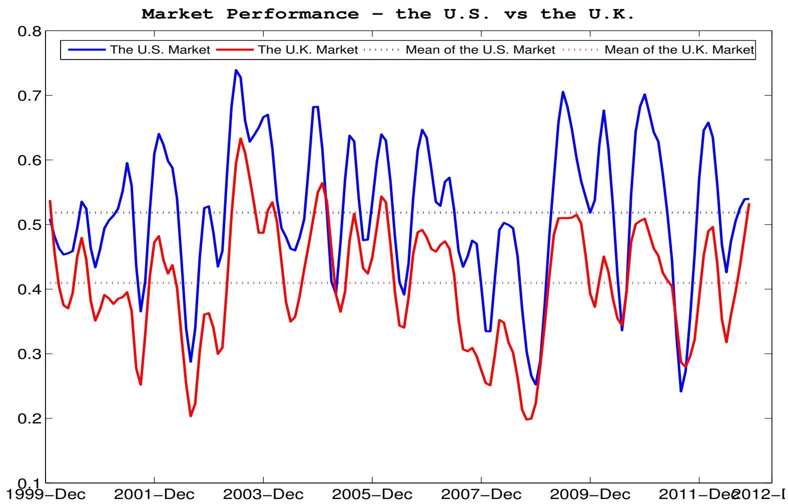
The observations so far provide evidence in favor of *H5*. In most countries - especially in those with large stock markets - the media effect is large and positive in good market conditions and not significant or even negative in bad market conditions. No country displays effects consistent with what continuation/reversal explanations (*H6*) would suggest. The results in Japan, Australia, Germany, Sweden plus in the countries that exhibit a significant positive unconditional media effect[74] are entirely consistent with *H5*: A significant positive no-media premium when we condition on positive market states and an insignificant premium conditional on bad market states. Thus, the no-high media coverage strategy is not consistently profitable independent of the market states - similar to momentum premiums, as pointed out by Chordia and Shivakumar (2002) or Cooper, Gutierrez, and Hameed (2004).

At the end it is the asymmetry in the direction and absolute magnitude of the media effect over good/bad market condition months, combined with the fraction of good/bad market months, that determines whether we find a positive or negative unconditional no-media premium in the cross-section of stocks in the respective markets.

As Table VII indicates, the positive media effect we find in the cross-section of all U.S. stocks for example, seems to be a consequence of the relatively few bad market months during the sample period and the asymmetry, both in terms of sign and magnitude, of the media effect between good/bad market months. A comparison to the UK makes this mechanism clear-cut. The U.S. has the highest proportion of good states over the whole sample period, with 57% of the months being good states, whereas the UK has the lowest proportion of good market state months (only 26%). Figure 1 plots the (smoothed) market condition measure for the U.S. and the UK over time, together with the respective market condition means. We observe that the two market condition lines are highly correlated. Nevertheless, the market conditions are bad on average in the UK and good on average in the U.S., and the U.S. stock market outperforms the UK stock market almost all the time. Hence, whereas in the U.S. good market

[73]Only exceptions to this are Austria and Finland.
[74]Austria and Belgium are the exceptions.

Figure 1. Cross-sectional fraction of stocks with positive returns in each month in the U.S. and the UK over time. The presented values are smoothed with moving average of lag 5.



months dominate bad market months (both, in terms of count and absolute magnitude of the effect), we observe the opposite in the UK. There are more negative market months, and the magnitude of the negative effect in bad market months clearly dominates the positive effect in good market months. As a consequence, we observe a negative unconditional no-media premium in the cross-section of all UK stocks when we look at our entire sample period.

Table VIII presents the return premiums that result when we apply our simple market state measure as a (out-of-sample) signal on the original long-short strategy. Instead of always being long no-coverage stocks and and short high coverage stocks, we reverse the long-short portfolio by taking long position on high media coverage stocks and short position on no-media coverage stocks when the market state is bad. Of course, this only makes the results stronger in markets where the media effects' return prefix changes to negative following bad market condition months[75].

As Table VIII reveals, such a strategy consistently yields highly significant and large positive portfolio returns. In the U.S. for example, the Carhart-alpha more than doubles compared to the original long-short; 0.70% compared to 0.32% per month. In the U.S., Japan and all APAC countries (Hongkong, Singapore, Australia, New Zealand), as well as in the UK, France, Germany, Switzerland, Spain and Sweden we see significantly positive return premiums of large magnitudes after controlling for all risk factors. In Spain and Switzerland - as expected given the results in Table VII - the return becomes slightly weaker compared to the unconditional no-media premium. In Italy and Denmark the return premiums become positive (in the original

[75]This is the case in the U.S., the UK, Japan, Australia, Hongkong, New Zealand, Singapore, France, Italy and Sweden.

long-short strategy they were insignificantly negative), although not significantly so.

Table VIII. Market State Based Media Strategy Returns Across Countries. At the end of each month t, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The market state in a given month is considered good/bullish (bad/bearish), if the percentage of stocks with positive (negative) returns during that month exceeds 50%. Following good (bad) market state months, we go long (short) the No-Coverage and short (long) the High-Coverage portfolio. The portfolios are held during month $t+1$ and rebalanced monthly. The resulting returns are evaluated against widely accepted risk factors. Time-series means and factor alphas are reported. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Regression Model	Long Leg	Short Leg	Long-Short
Panel 1 : USA			
TS Mean	0.0149	0.0079	0.0070***
CAPM Alpha	0.0119***	0.0049**	0.0070***
FF Alpha	0.0085***	0.0015	0.0070***
Carhart Alpha	0.0087***	0.0017	0.0070***
Panel 2 : Australia			
TS Mean	0.0216	0.0090	0.0126***
CAPM Alpha	0.0192	0.0066	0.0126***
FF Alpha	0.0244***	0.0117	0.0128***
Carhart Alpha	0.0336***	0.0202***	0.0133***
Panel 3 : Hongkong			
TS Mean	0.0186	0.0063	0.0123***
CAPM Alpha	0.0085	-0.0031	0.0116**
FF Alpha	0.0032*	-0.0083***	0.0115***
Carhart Alpha	0.0038**	-0.0074***	0.0111***
Panel 4 : Japan			
TS Mean	0.0068	0.0041	0.0027*
CAPM Alpha	0.0073***	0.0046**	0.0027**
FF Alpha	0.0039***	0.0003	0.0035***
Carhart Alpha	0.0038***	0.0002	0.0036***
Panel 5 : NewZealand			
TS Mean	0.0191	0.0092	0.0099**
CAPM Alpha	0.0115**	0.0012	0.0103**
FF Alpha	0.0129**	0.0016	0.0113**
Carhart Alpha	0.0137**	0.0020	0.0116**
Panel 6 : Singapore			
TS Mean	0.0140	0.0085	0.0055**
CAPM Alpha	0.0051**	-0.0002	0.0054***
FF Alpha	0.0031*	-0.0019	0.0050**
Carhart Alpha	0.0037*	-0.0015	0.0051**
Panel 7 : UK			
TS Mean	0.0067	-0.0019	0.0086***
CAPM Alpha	0.0032	-0.0052	0.0084***
FF Alpha	0.0100	0.0018	0.0082***
Carhart Alpha	0.0157***	0.0074	0.0084***
Panel 8 : Germany			
TS Mean	0.0059	0.0053	0.0006
CAPM Alpha	0.0050	0.0042	0.0007
FF Alpha	0.0124	0.0093	0.0031
Carhart Alpha	0.0220***	0.0167***	0.0053*
Panel 9 : France			
TS Mean	0.0130	0.0060	0.0070**
CAPM Alpha	0.0127	0.0053	0.0074***
FF Alpha	0.0187***	0.0107**	0.0080***
Carhart Alpha	0.0204***	0.0124***	0.0080***

Overall, employing market states as a signal yields positive return premiums in all countries in our sample, but Belgium, Norway, Austria and Greece (all with small stock market capital-

Table VIII. Market State Based Media Strategy Returns Across Countries - Continued

Regression Model	Long Leg	Short Leg	Long-Short
Panel 10 : Switzerland			
TS Mean	0.0091	0.0044	0.0047*
CAPM Alpha	0.0109	0.0061	0.0048**
FF Alpha	0.0124**	0.0074	0.0051**
Carhart Alpha	0.0163***	0.0100**	0.0064***
Panel 11 : Spain			
TS Mean	0.0086	0.0035	0.0051
CAPM Alpha	0.0039	-0.0005	0.0044*
FF Alpha	0.0032	-0.0008	0.0040*
Carhart Alpha	0.0051**	0.0009	0.0042*
Panel 12 : Sweden			
TS Mean	0.0104	0.0034	0.0070**
CAPM Alpha	0.0087	0.0018	0.0069**
FF Alpha	0.0121	0.0050	0.0071**
Carhart Alpha	0.0162**	0.0094	0.0068*
Panel 13 : Netherlands			
TS Mean	0.0090	0.0054	0.0035
CAPM Alpha	0.0053	0.0014	0.0040
FF Alpha	0.0052*	0.0011	0.0041
Carhart Alpha	0.0052*	0.0011	0.0041
Panel 14 : Belgium			
TS Mean	0.0085	0.0088	-0.0003
CAPM Alpha	0.0045*	0.0050**	-0.0006
FF Alpha	0.0016	0.0026	-0.0010
Carhart Alpha	0.0018	0.0026	-0.0007
Panel 15 : Norway			
TS Mean	0.0100	0.0080	0.0019
CAPM Alpha	-0.0022	-0.0026	0.0004
FF Alpha	-0.0030	-0.0025	-0.0005
Carhart Alpha	-0.0008	-0.0012	0.0004
Panel 16 : Italy			
TS Mean	0.0020	-0.0006	0.0026
CAPM Alpha	0.0032	0.0003	0.0029
FF Alpha	0.0029	0.0004	0.0025
Carhart Alpha	0.0065	0.0046	0.0019
Panel 17 : Finland			
TS Mean	0.0077	0.0079	-0.0002
CAPM Alpha	0.0031	0.0037	-0.0006
FF Alpha	0.0033	0.0023	0.0010
Carhart Alpha	0.0039	0.0017	0.0022
Panel 18 : Austria			
TS Mean	0.0097	0.0107	-0.0010
CAPM Alpha	0.0011	0.0037	-0.0026
FF Alpha	0.0008	0.0034	-0.0026
Carhart Alpha	0.0019	0.0035	-0.0016
Panel 19 : Denmark			
TS Mean	0.0107	0.0096	0.0011
CAPM Alpha	0.0062*	0.0056	0.0007
FF Alpha	0.0027	0.0042	-0.0015
Carhart Alpha	0.0032	0.0037	-0.0005
Panel 20 : Greece			
TS Mean	-0.0050	-0.0052	0.0002
CAPM Alpha	-0.0106*	-0.0099*	-0.0007
FF Alpha	-0.0154**	-0.0151**	-0.0003
Carhart Alpha	-0.0115	-0.0112*	-0.0003

izations). In countries with large stock markets[76], the resulting return premiums are strongest and most significant.

[76]Our 20 countries in order of their stock market capitalization: USA, Japan, the UK, France, Germany, Australia, Hongkong, Switzerland, Spain, the Netherlands, Sweden, Italy, Singapore, Belgium, Norway, Denmark, Finland, Austria, New Zealand, Greece.

Table IX contains the results for portfolio holding periods ranging from 1 to 12 months for the countries with a significant return premium at the one-month horizon. As can be seen, the positive return premiums that we find at the one-month horizon always extend in a highly significant and consistent manner to all considered holding periods. Hence, this strategy yields return premiums that turn out to be very stable and persistent across different portfolio holding periods.

In Section F in the Appendix we present tables containing the premiums resulting from applying our signal-based strategy to subsamples of stocks, formed according to different firm properties and illiquidity measures. The tables contain the resulting risk-adjusted returns (alphas) for the countries with a significant premium at the one-month horizon.

Within the terciles formed according to market capitalization, we find the return premium to be strongest among small caps in the U.S. and Japan. In the remaining markets, the premium is strongest, both in terms of magnitude and significance, among the stocks with the largest market value. Within market-to-book value sorts, there is a tendency towards medium and large market-to-book value terciles exhibiting the largest strategy returns. But in general, we find positive and often significant strategy returns across all market-to-book value terciles in the vast majority of countries. This is also the case for the sorts with respect to current month and past year returns: The resulting return premia are consistently positive across all terciles and mostly significant. Most importantly, we find the strategy returns to be largest and most significant among the most liquid sets of stocks (those with high price, low bid-ask spread, high volume and low Amihud illiquidity ratio). The only exception to this is Singapore, where the returns are by trend larger among illiquid stocks.

Altogether, the resulting return premiums are very well-behaved in the considered countries[77]. The premiums are highly persistent: They are significantly positive and stable for portfolio holding periods well beyond the one-month horizon. Moreover, we consistently find positive return premiums across most firm characteristic terciles in all considered stock markets, and they are often statistically significant.

5 Conclusion

We analyze the relation of mass media coverage and the cross-section of stock returns in 20 developed countries with large stock markets. We build on the work of Fang and Peress (2009), which provides empirical evidence for the existence of a positive no-media premium in the U.S. stock market. They show that stocks not covered by mass media earn significantly higher

[77]Opposed to the results we get when analyzing the pure no-high media coverage portfolio returns within subgroups of stocks.

Table IX. Market State Based Media Strategy Returns Across Countries - Longer Holding Periods. At the end of each month t, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The market state in a given month is considered good/bullish (bad/bearish), if the percentage of stocks with positive (negative) returns during that month exceeds 50%. Following good (bad) market state months, we go long (short) the No-Coverage and short (long) the High-Coverage portfolio. The portfolios are held from t to $t+k$, with $k = 1, 3, 6, 9, 12$ months (holding period). We use the overlapping portfolio approach of Jagadeesh and Titman (1993) to calculate the returns. The resulting returns are evaluated against widely accepted risk factors. Time-series means and factor alphas are reported. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Holding Period	TS Mean	CAPM Alpha	FF Alpha	Carhart Alpha
Panel 1 : USA				
1 month	0.0070***	0.0070***	0.0070***	0.0070***
3 months	0.0060***	0.0059***	0.0057***	0.0057***
6 months	0.0054***	0.0054***	0.0053***	0.0052***
9 months	0.0053***	0.0052***	0.0051***	0.0050***
12 months	0.0051***	0.0050***	0.0048***	0.0048***
Panel 2: Australia				
1 month	0.0126***	0.0126***	0.0128***	0.0133***
3 months	0.0115***	0.0115***	0.0119***	0.0121***
6 months	0.0120***	0.0119***	0.0124***	0.0124***
9 months	0.0116***	0.0116***	0.0120***	0.0120***
12 months	0.0115***	0.0115***	0.0118***	0.0118***
Panel 3: Hongkong				
1 month	0.0123***	0.0116**	0.0115***	0.0111***
3 months	0.0134***	0.0126***	0.0122***	0.0119***
6 months	0.0135***	0.0127**	0.0122***	0.0114***
9 months	0.0139***	0.0130***	0.0126***	0.0116***
12 months	0.0135***	0.0127**	0.0122***	0.0110***
Panel 4: Japan				
1 month	0.0027*	0.0027**	0.0035***	0.0036***
3 months	0.0016	0.0016	0.0020*	0.0020*
6 months	0.0015	0.0016	0.0018	0.0018*
9 months	0.0013	0.0013	0.0016	0.0016
12 months	0.0014	0.0015	0.0017	0.0018
Panel 5: New Zealand				
1 month	0.0099**	0.0103**	0.0113**	0.0116**
3 months	0.0082**	0.0090**	0.0098**	0.0107**
6 months	0.0062*	0.0068**	0.0069*	0.0078*
9 months	0.0058	0.0064*	0.0060	0.0071*
12 months	0.0042	0.0047	0.0041	0.0055

future returns than stocks that are highly covered by mass media, even after controlling for widely accepted risk characteristics. Our study is different from Fang and Peress (2009) along four dimensions: We employ an alternative measure of mass media coverage, which also comprises internet news sources and that is conveniently obtained from the Bloomberg News Trend database. We focus on a more recent and longer time period and extend the analysis to larger set of U.S. stocks, covering the entire NYSE and NASDAQ stock universe. We expand the analysis to an international level by additionally analyzing the entire stock markets in 19 major European

Table IX. Market State Based Media Strategy Returns Across Countries - Longer Holding Periods - Continued

Holding Period	TS Mean	CAPM Alpha	FF Alpha	Carhart Alpha
Panel 6: Singapore				
1 month	0.0055**	0.0054***	0.0050**	0.0051**
3 months	0.0054**	0.0051***	0.0047***	0.0051***
6 months	0.0056**	0.0053***	0.0049***	0.0053***
9 months	0.0055**	0.0052***	0.0047***	0.0052***
12 months	0.0056**	0.0053***	0.0047**	0.0052***
Panel 7: UK				
1 month	0.0086***	0.0084***	0.0082***	0.0084***
3 months	0.0078***	0.0076***	0.0075***	0.0078***
6 months	0.0076***	0.0074***	0.0073***	0.0075***
9 months	0.0070***	0.0068***	0.0068***	0.0069***
12 months	0.0068***	0.0066***	0.0066***	0.0067***
Panel 8: France				
1 month	0.0070**	0.0074***	0.0080***	0.0080***
3 months	0.0069**	0.0072***	0.0079***	0.0079***
6 months	0.0069***	0.0072***	0.0078***	0.0078***
9 months	0.0068***	0.0071***	0.0078***	0.0078***
12 months	0.0066***	0.0070***	0.0076***	0.0076***
Panel 9: Switzerland				
1 month	0.0047*	0.0048**	0.0051**	0.0064***
3 months	0.0033	0.0034	0.0036*	0.0048**
6 months	0.0032	0.0033	0.0036*	0.0046**
9 months	0.0030	0.0031	0.0033	0.0043**
12 months	0.0034	0.0035	0.0036*	0.0046**
Panel 10: Spain				
1 month	0.0051	0.0044*	0.0040*	0.0042*
3 months	0.0051	0.0041*	0.0037*	0.0040*
6 months	0.0049*	0.0044**	0.0041**	0.0044**
9 months	0.0048*	0.0045**	0.0043**	0.0046**
12 months	0.0045	0.0045**	0.0044**	0.0047**
Panel 11: Sweden				
1 month	0.0070**	0.0069**	0.0071**	0.0068*
3 months	0.0077**	0.0076***	0.0073**	0.0068*
6 months	0.0094***	0.0093***	0.0089***	0.0084**
9 months	0.0090***	0.0089***	0.0084***	0.0081**
12 months	0.0094***	0.0093***	0.0088***	0.0085**

and Asian countries. And we show, similar to the findings by Cooper, Gutierrez, and Hameed (2004) with respect to momentum returns, that the relation of mass media coverage and the cross-section of stock returns in most markets depends on whether the market conditions/states are good or bad.

For the U.S. stock market, we find unconditional results that are qualitatively very similar to the findings of Fang and Peress (2009): Stocks neglected by mass media earn a statistically significant and economically important return premium, compared to stocks highly covered by mass media, and the effect is strongest among the most illiquid set of stocks. Internationally, only seven additional stock markets (Hongkong, France, Switzerland, Spain, the Netherlands, Belgium and Austria) exhibit positive no-media premiums that are statistically significant and economically large. In Hongkong and Belgium, the positive return differential between no- and high-media coverage stocks is likely to be rooted in the continuation/reversal patterns suggested by the findings of Chan (2003) and Tetlock (2010). In the UK, we find a large and significant negative no-media premium. Nevertheless, in most countries we find a positive media effect among small and illiquid stocks and among loser stocks with low current month returns, suggesting that the role of mass media is very important for these subsets of stocks.

Interestingly, when we condition on the market state being positive, we find a positive, mostly economically large no-media premium in the vast majority of countries: Portfolios containing stocks that are not covered by mass media during positive market months subsequently clearly outperform portfolios containing stocks that are highly covered during positive market months. For large stock markets, this effect is most pronounced. Conditional on the market state being negative on the other hand, we find much smaller and mostly insignificant or negative no-media premiums.

Utilizing the state of the market as a signal, we evaluate the returns on a strategy that is long stocks not covered and short stocks highly covered by mass media when the market state is positive, and the opposite when the market state is negative. The resulting return premiums turn out to be positive in 16 out of 20 countries. Among the countries with the largest stock market capitalizations, we find the premiums to be statistically highly significant, to remain significant for portfolio holding periods up to 12 months, and to be very stable and well-behaved when evaluated within various subgroups of stocks, formed according to important firm characteristics and liquidity proxies. The strategy returns are largest and most significant among the most liquid stocks.

Our results show that mass media coverage plays an important role in explaining cross-sectional differences in stock returns. No-coverage stocks provide significantly larger returns relative to high-coverage stocks, especially following good states of the market, even after controlling for well-known risk factors. Our findings imply that the extent of informational efficiency in many stock markets around the world seems to be still limited. An interesting extension to our study could be analyzing the contributing factors to the heterogeneity in media premiums across countries. Analyzing the differences across countries in a panel setting could also shed light on potential explanations for the existence of media premiums.

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A Data

Variable	Type	Description
		I. Media Coverage Variables
Media Coverage	Cross-Section & monthly time series	Total number of articles with high relevance published about the firm during a month t. Higher numbers imply high media coverage for the firm. Source: Bloomberg News Trend.
		II. Financial Variables
MV	Cross-section & monthly time series	Market Capitalization. Source: Bloomberg.
MTBVyearly	Cross-section & yearly time series	Monthly market price to book value ratios per share at the previous year end. Source: Bloomberg
RETpastyear	Cross-section & monthly time series	Return realized over previous year.
RETcurrentmonth	Cross-section & monthly time series	Monthly return realized at month t.
Pavgpast	Cross-section & monthly time series	Average closing price during previous month.
BidAskSpread	Cross-section & monthly time series	Monthly $\frac{(BidPrice-AskPrice)}{2}$, employing the bid and ask prices at the end of each month.
VAavgpastyear	Cross-section & yearly time series	Average Trading Volume by value over the last year.
Amihud	Cross-section & yearly time series	Amihud's Illiquidity Ratio: Absolute return divided by daily trading volume.

B Comparison of the Two News Sources: Factiva and Bloomberg

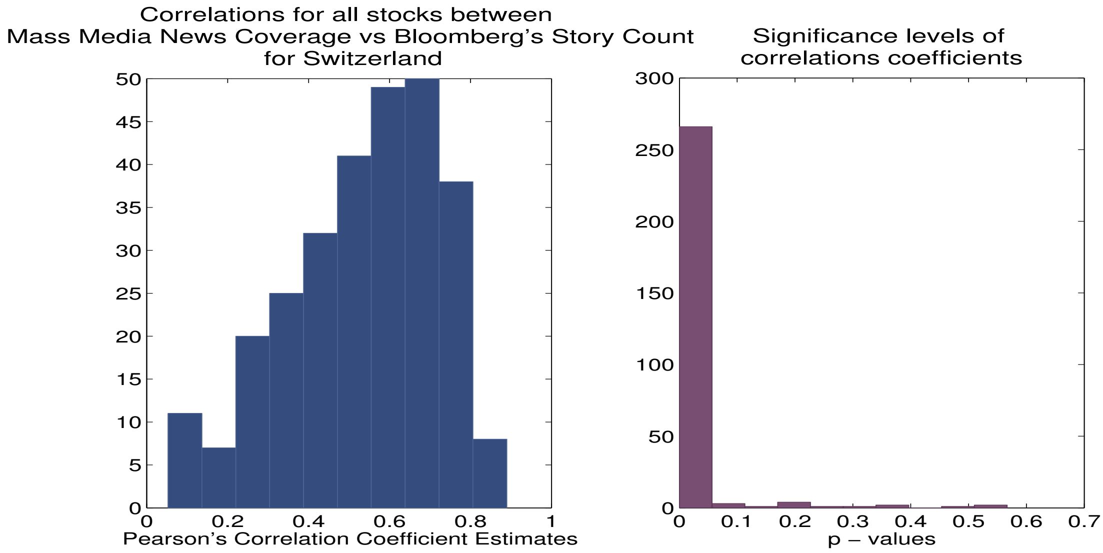


Figure 2. Pearson's Correlation Coefficient Estimates between Factiva mass media coverage and Bloomberg's Worldwide media coverage

C Unconditional Results for all Formation and Holding Periods

Table X. Media Premiums of Individual Countries over Longer Formation and Holding Periods. This Table reports the returns on a zero-investment portfolio that goes long stocks with No media coverage over the last k months and short stocks with High media coverage over the last k months (formation period), with $k = 1, 3, 6, 9, 12$. The portfolios are held from t to $t + k$, with $k = 1, 3, 6, 9, 12$ months (holding period). We use the overlapping portfolio approach of Jagadeesh and Titman (1993) to calculate the returns. Time-series means plus alpha estimates resulting from regressing the monthly long-short portfolio returns on widely accepted risk factors are reported. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Holding Period	TS Mean	CAPM Alpha	FF Alpha	Carhart Alpha
Austria				
Panel 1: Formation Period = 1 Month				
1 month	0.0044	0.0079**	0.0077**	0.0074**
3 months	0.0040	0.0072***	0.0066***	0.0065***
6 months	0.0018	0.0055**	0.0050**	0.0048**
9 months	0.0011	0.0044*	0.0039*	0.0038*
12 months	0.0007	0.0042*	0.0037*	0.0035*
Panel 2: Formation Period = 3 Months				
1 month	0.0055	0.0094**	0.0091***	0.0089***
3 months	0.0039	0.0075***	0.0071***	0.0068***
6 months	0.0019	0.0057**	0.0053**	0.0050**
9 months	0.0009	0.0046*	0.0042*	0.0039*
12 months	0.0003	0.0044*	0.0040*	0.0036
Panel 3: Formation Period = 6 Months				
1 month	0.0047	0.0090***	0.0086***	0.0081***
3 months	0.0034	0.0072**	0.0067**	0.0063**
6 months	0.0014	0.0057**	0.0052**	0.0048*
9 months	0.0007	0.0049*	0.0045*	0.0042*
12 months	0.0007	0.0049*	0.0045*	0.0041*
Panel 4: Formation Period = 9 Months				
1 month	0.0052	0.0096***	0.0092***	0.0089***
3 months	0.0030	0.0070**	0.0065**	0.0061**
6 months	0.0012	0.0056*	0.0051*	0.0048*
9 months	0.0009	0.0052*	0.0047*	0.0043*
12 months	0.0005	0.0048*	0.0043	0.0039
Panel 5: Formation Period = 12 Months				
1 month	0.0040	0.0091**	0.0084***	0.0081***
3 months	0.0022	0.0068**	0.0061**	0.0058**
6 months	0.0009	0.0057**	0.0051*	0.0046*
9 months	0.0004	0.0052*	0.0046*	0.0042
12 months	-0.0003	0.0046	0.0039	0.0035
Belgium				
Panel 1: Formation Period = 1 Month				
1 month	0.0089***	0.0100***	0.0098***	0.0086***
3 months	0.0039	0.0050***	0.0052***	0.0034*
6 months	0.0022	0.0033*	0.0037**	0.0019
9 months	0.0023	0.0033*	0.0034**	0.0018
12 months	0.0023	0.0033*	0.0033*	0.0018
Panel 2: Formation Period = 3 Months				
1 month	0.0067*	0.0083***	0.0086***	0.0071***
3 months	0.0025	0.0040*	0.0043**	0.0028
6 months	0.0006	0.0020	0.0024	0.0008
9 months	0.0006	0.0019	0.0022	0.0006
12 months	0.0005	0.0018	0.0018	0.0003
Panel 3: Formation Period = 6 Months				
1 month	0.0068*	0.0086***	0.0089***	0.0072***
3 months	0.0015	0.0032	0.0037	0.0017
6 months	-0.0001	0.0016	0.0020	0.0000
9 months	-0.0003	0.0012	0.0015	-0.0002
12 months	0.0002	0.0017	0.0018	0.0002
Panel 4: Formation Period = 9 Months				
1 month	0.0058	0.0078***	0.0079***	0.0059**
3 months	0.0013	0.0032	0.0035	0.0015
6 months	0.0001	0.0019	0.0021	0.0003
9 months	0.0001	0.0018	0.0018	0.0002
12 months	0.0006	0.0022	0.0021	0.0006
Panel 5: Formation Period = 12 Months				
1 month	0.0045	0.0069***	0.0077***	0.0049*
3 months	-0.0001	0.0023	0.0031	0.0006
6 months	-0.0013	0.0009	0.0017	-0.0008
9 months	-0.0013	0.0009	0.0015	-0.0007
12 months	-0.0007	0.0014	0.0019	-0.0003

Table X. Media Premiums of Individual Countries over Longer Formation and Holding Periods - Continued.

Holding Period	TS Mean	CAPM Alpha	FF Alpha	Carhart Alpha
France				
Panel 1: Formation Period = 1 Month				
1 month	0.0074**	0.0067***	0.0056***	0.0056***
3 months	0.0038	0.0032*	0.0022	0.0022
6 months	0.0023	0.0017	0.0008	0.0007
9 months	0.0023	0.0017	0.0009	0.0008
12 months	0.0022	0.0017	0.0008	0.0008
Panel 2: Formation Period = 3 Months				
1 month	0.0064**	0.0056***	0.0048***	0.0048***
3 months	0.0024	0.0016	0.0009	0.0009
6 months	0.0012	0.0004	-0.0001	-0.0002
9 months	0.0013	0.0005	-0.0001	-0.0001
12 months	0.0011	0.0004	-0.0002	-0.0002
Panel 3: Formation Period = 6 Months				
1 month	0.0057*	0.0045**	0.0036**	0.0035**
3 months	0.0022	0.0010	0.0004	0.0003
6 months	0.0011	-0.0000	-0.0006	-0.0006
9 months	0.0011	-0.0000	-0.0006	-0.0006
12 months	0.0012	0.0001	-0.0004	-0.0005
Panel 4: Formation Period = 9 Months				
1 month	0.0055*	0.0039*	0.0032*	0.0032*
3 months	0.0022	0.0006	0.0001	0.0001
6 months	0.0009	-0.0007	-0.0010	-0.0011
9 months	0.0010	-0.0006	-0.0009	-0.0010
12 months	0.0013	-0.0002	-0.0005	-0.0006
Panel 5: Formation Period = 12 Months				
1 month	0.0051	0.0037*	0.0033*	0.0032*
3 months	0.0015	0.0002	-0.0002	-0.0003
6 months	0.0005	-0.0008	-0.0010	-0.0011
9 months	0.0005	-0.0007	-0.0010	-0.0011
12 months	0.0007	-0.0005	-0.0008	-0.0009
Netherlands				
Panel 1: Formation Period = 1 Month				
1 month	0.0067**	0.0069***	0.0060**	0.0059**
3 months	0.0067**	0.0071***	0.0066***	0.0066***
6 months	0.0041	0.0045**	0.0038*	0.0037*
9 months	0.0032	0.0036*	0.0029	0.0029
12 months	0.0033	0.0036*	0.0029	0.0029
Panel 2: Formation Period = 3 Months				
1 month	0.0056	0.0064***	0.0056	0.0056*
3 months	0.0068	0.0080**	0.0077**	0.0077**
6 months	0.0032	0.0040*	0.0031	0.0031
9 months	0.0030	0.0034	0.0026	0.0026
12 months	0.0028	0.0032	0.0025	0.0025
Panel 3: Formation Period = 6 Months				
1 month	0.0081*	0.0088***	0.0078***	0.0078***
3 months	0.0065	0.0072**	0.0069**	0.0069**
6 months	0.0037	0.0043*	0.0036	0.0036
9 months	0.0032	0.0035	0.0030	0.0030
12 months	0.0027	0.0031	0.0026	0.0026
Panel 4: Formation Period = 9 Months				
1 month	0.0076	0.0083**	0.0080**	0.0079**
3 months	0.0061	0.0068*	0.0069	0.0069
6 months	0.0029	0.0032	0.0027	0.0026
9 months	0.0024	0.0024	0.0019	0.0018
12 months	0.0025	0.0025	0.0019	0.0019
Panel 5: Formation Period = 12 Months				
1 month	0.0055	0.0059*	0.0051	0.0050
3 months	0.0051	0.0057	0.0056	0.0053
6 months	0.0013	0.0017	0.0008	0.0006
9 months	0.0011	0.0014	0.0006	0.0004
12 months	0.0012	0.0014	0.0007	0.0006

Table X. Media Premiums of Individual Countries over Longer Formation and Holding Periods - Continued.

Holding Period	TS Mean	CAPM Alpha	FF Alpha	Carhart Alpha
Spain				
Panel 1: Formation Period = 1 Month				
1 month	0.0052	0.0063**	0.0063***	0.0062**
3 months	0.0039	0.0047*	0.0045*	0.0044*
6 months	0.0027	0.0035	0.0034	0.0033
9 months	0.0018	0.0027	0.0026	0.0025
12 months	0.0014	0.0022	0.0022	0.0021
Panel 2: Formation Period = 3 Months				
1 month	0.0038	0.0042**	0.0041	0.0037
3 months	0.0038	0.0042	0.0040	0.0038
6 months	0.0026	0.0031	0.0030	0.0029
9 months	0.0015	0.0025	0.0024	0.0023
12 months	0.0013	0.0021	0.0021	0.0020
Panel 3: Formation Period = 6 Months				
1 month	0.0034	0.0043	0.0044	0.0039
3 months	0.0030	0.0039	0.0040	0.0038
6 months	0.0015	0.0028	0.0028	0.0027
9 months	0.0011	0.0023	0.0024	0.0023
12 months	0.0010	0.0021	0.0022	0.0022
Panel 4: Formation Period = 9 Months				
1 month	0.0036	0.0041	0.0042	0.0039
3 months	0.0028	0.0037	0.0039	0.0035
6 months	0.0015	0.0024	0.0025	0.0022
9 months	0.0012	0.0023	0.0024	0.0021
12 months	0.0010	0.0020	0.0022	0.0019
Panel 5: Formation Period = 12 Months				
1 month	0.0040	0.0052*	0.0049*	0.0046
3 months	0.0031	0.0046	0.0043	0.0041
6 months	0.0021	0.0036	0.0034	0.0032
9 months	0.0017	0.0033	0.0032	0.0030
12 months	0.0016	0.0032	0.0031	0.0029
Switzerland				
Panel 1: Formation Period = 1 Month				
1 month	0.0051*	0.0046**	0.0044**	0.0038**
3 months	0.0049*	0.0044**	0.0043***	0.0036**
6 months	0.0039	0.0035*	0.0034**	0.0028**
9 months	0.0032	0.0028	0.0027**	0.0021
12 months	0.0027	0.0023	0.0022*	0.0017
Panel 2: Formation Period = 3 Months				
1 month	0.0049	0.0044**	0.0050**	0.0041*
3 months	0.0049	0.0045*	0.0049**	0.0041**
6 months	0.0036	0.0031	0.0036*	0.0027
9 months	0.0033	0.0028	0.0032*	0.0023
12 months	0.0027	0.0022	0.0027	0.0019
Panel 3: Formation Period = 6 Months				
1 month	0.0044	0.0034	0.0035*	0.0026
3 months	0.0042	0.0032	0.0032	0.0024
6 months	0.0034	0.0025	0.0025	0.0016
9 months	0.0028	0.0019	0.0018	0.0010
12 months	0.0024	0.0015	0.0015	0.0007
Panel 4: Formation Period = 9 Months				
1 month	0.0049	0.0035	0.0033	0.0025
3 months	0.0049	0.0035	0.0033	0.0025
6 months	0.0040	0.0026	0.0025	0.0018
9 months	0.0035	0.0022	0.0021	0.0014
12 months	0.0033	0.0020	0.0020	0.0014
Panel 5: Formation Period = 12 Months				
1 month	0.0028	0.0015	0.0015	0.0006
3 months	0.0034	0.0021	0.0021	0.0012
6 months	0.0029	0.0016	0.0017	0.0008
9 months	0.0027	0.0014	0.0015	0.0007
12 months	0.0028	0.0015	0.0015	0.0008

Table X. Media Premiums of Individual Countries over Longer Formation and Holding Periods - Continued.

Holding Period	TS Mean	CAPM Alpha	FF Alpha	Carhart Alpha
the U.K.				
Panel 1: Formation Period = 1 Month				
1 month	-0.0047**	-0.0044**	-0.0034*	-0.0028
3 months	-0.0041**	-0.0038**	-0.0030*	-0.0026
6 months	-0.0040**	-0.0037**	-0.0030**	-0.0027*
9 months	-0.0035*	-0.0032*	-0.0026*	-0.0022
12 months	-0.0037**	-0.0035**	-0.0028**	-0.0024*
Panel 2: Formation Period = 3 Months				
1 month	-0.0063***	-0.0058**	-0.0046***	-0.0042**
3 months	-0.0061***	-0.0056***	-0.0045**	-0.0044**
6 months	-0.0062***	-0.0057***	-0.0046***	-0.0045**
9 months	-0.0052**	-0.0047***	-0.0037**	-0.0035**
12 months	-0.0057***	-0.0052***	-0.0043***	-0.0040***
Panel 3: Formation Period = 6 Months				
1 month	-0.0079***	-0.0077***	-0.0066***	-0.0065***
3 months	-0.0075***	-0.0073***	-0.0062***	-0.0062***
6 months	-0.0066***	-0.0064***	-0.0055***	-0.0054***
9 months	-0.0062***	-0.0059***	-0.0051***	-0.0049***
12 months	-0.0057***	-0.0055***	-0.0047***	-0.0044***
Panel 4: Formation Period = 9 Months				
1 month	-0.0084***	-0.0084***	-0.0071***	-0.0071***
3 months	-0.0078***	-0.0078***	-0.0066***	-0.0067***
6 months	-0.0074***	-0.0074***	-0.0063***	-0.0063***
9 months	-0.0065***	-0.0065***	-0.0054***	-0.0053***
12 months	-0.0060***	-0.0060***	-0.0049***	-0.0047***
Panel 5: Formation Period = 12 Months				
1 month	-0.0094***	-0.0092***	-0.0081***	-0.0081***
3 months	-0.0088***	-0.0086***	-0.0076***	-0.0076***
6 months	-0.0076***	-0.0074***	-0.0064***	-0.0064***
9 months	-0.0066***	-0.0064***	-0.0054***	-0.0053***
12 months	-0.0060***	-0.0058***	-0.0048***	-0.0045**
Hong Kong				
Panel 1: Formation Period = 1 Month				
1 month	0.0095**	0.0107**	0.0086***	0.0071***
3 months	0.0103***	0.0116**	0.0102***	0.0084***
6 months	0.0098**	0.0111**	0.0097***	0.0077***
9 months	0.0098**	0.0111**	0.0097***	0.0075***
12 months	0.0095**	0.0108**	0.0094***	0.0073***
Panel 2: Formation Period = 3 Months				
1 month	0.0097***	0.0109**	0.0114***	0.0103***
3 months	0.0087**	0.0099**	0.0109***	0.0098***
6 months	0.0083**	0.0096**	0.0105***	0.0092***
9 months	0.0078**	0.0091**	0.0103***	0.0089***
12 months	0.0076**	0.0089**	0.0101***	0.0086***
Panel 3: Formation Period = 6 Months				
1 month	0.0088**	0.0103**	0.0109***	0.0095***
3 months	0.0083**	0.0100**	0.0108***	0.0092***
6 months	0.0081**	0.0098**	0.0109***	0.0090***
9 months	0.0078**	0.0096**	0.0109***	0.0087***
12 months	0.0077**	0.0094**	0.0107***	0.0083***
Panel 4: Formation Period = 9 Months				
1 month	0.0098***	0.0114**	0.0111***	0.0092***
3 months	0.0091**	0.0107**	0.0110***	0.0086***
6 months	0.0092**	0.0108**	0.0114***	0.0086***
9 months	0.0087**	0.0104**	0.0110***	0.0080***
12 months	0.0087**	0.0103**	0.0109***	0.0078***
Panel 5: Formation Period = 12 Months				
1 month	0.0095**	0.0114**	0.0111***	0.0086***
3 months	0.0092**	0.0112**	0.0113***	0.0085***
6 months	0.0093**	0.0113**	0.0115***	0.0083***
9 months	0.0091**	0.0111**	0.0114***	0.0080***
12 months	0.0091**	0.0111**	0.0113***	0.0078***

D Current Month Losers and Winners: Double-Sort Results across Countries

Table XI. Media Premiums for Current Month Losers over Longer Holding Periods. This table reports the Carhart-alphas on equally weighted No minus High media coverage (No-High) portfolios formed among stocks in the lowest current month return tercile. At the end of each month t we first sort all stocks into terciles according to their returns during month t. Within the low current month return tercile, we form portfolios based on media coverage. The portfolios are held from t to $t+k$, with $k = 1, 3, 6, 9, 12$ months (holding period) and 1 month formation period is used. We use the overlapping portfolio approach of Jagadeesh and Titman (1993) to calculate the returns. Carhart-alpha estimates from regressing the monthly returns on the No, on the High and on the No-High portfolio on Carhart factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Holding Period	No Media	High Media	No-High
	Panel 1 : USA		
1 month	0.0151***	0.0048**	0.0103***
3 months	0.0098***	0.0043**	0.0055***
6 months	0.0083***	0.0037**	0.0046***
9 months	0.0073***	0.0037**	0.0036**
12 months	0.0069***	0.0034**	0.0035**
	Panel 2 : Australia		
1 month	0.0453***	0.0173**	0.0280***
3 months	0.0295***	0.0184***	0.0111***
6 months	0.0272***	0.0235***	0.0037
9 months	0.0266***	0.0252***	0.0014
12 months	0.0265***	0.0250***	0.0015
	Panel 3 : Hongkong		
1 month	0.0035	-0.0106*	0.0142***
3 months	0.0022	-0.0101***	0.0123***
6 months	0.0006	-0.0106***	0.0112***
9 months	0.0005	-0.0096***	0.0101***
12 months	0.0001	-0.0107***	0.0108***
	Panel 4 : Japan		
1 month	0.0061***	0.0011	0.0050***
3 months	0.0028**	0.0010	0.0017
6 months	0.0029***	0.0012	0.0017
9 months	0.0026**	0.0015	0.0011
12 months	0.0021**	0.0011	0.0010
	Panel 5 : NewZealand		
1 month	0.0203***	0.0000	0.0205***
3 months	0.0062	0.0071	-0.0022
6 months	0.0034	0.0071	-0.0049
9 months	0.0026	0.0061	-0.0060
12 months	0.0025	0.0093*	-0.0085
	Panel 6 : Singapore		
1 month	0.0091***	-0.0029	0.0120***
3 months	-0.0004	-0.0024	0.0020
6 months	-0.0019	-0.0026	0.0008
9 months	-0.0010	-0.0023	0.0013
12 months	-0.0018	-0.0028	0.0010
	Panel 7 : UK		
1 month	0.0103*	0.0081	0.0022
3 months	0.0097*	0.0084	0.0012
6 months	0.0100*	0.0116**	-0.0015
9 months	0.0112**	0.0120**	-0.0008
12 months	0.0115**	0.0128**	-0.0012
	Panel 8 : Germany		
1 month	0.0369***	0.0177***	0.0192***
3 months	0.0213***	0.0143**	0.0070*
6 months	0.0169***	0.0154**	0.0015
9 months	0.0169***	0.0149**	0.0020
12 months	0.0163**	0.0154**	0.0009
	Panel 9 : France		
1 month	0.0349***	0.0174***	0.0176***
3 months	0.0198***	0.0140***	0.0057***
6 months	0.0155***	0.0128***	0.0026
9 months	0.0144**	0.0123**	0.0021
12 months	0.0138**	0.0119**	0.0019

Table XI. Media Premiums for Current Month Losers over Longer Holding Periods - Continued

Holding Period	No Media	High Media	No-High
	Panel 10 : Switzerland		
1 month	0.0167***	0.0097**	0.0070**
3 months	0.0141***	0.0108**	0.0032
6 months	0.0137***	0.0112**	0.0024
9 months	0.0141***	0.0114***	0.0026
12 months	0.0140***	0.0123***	0.0017
	Panel 11 : Spain		
1 month	0.0067*	0.0027	0.0040
3 months	0.0051*	0.0017	0.0035
6 months	0.0037	0.0020	0.0017
9 months	0.0042	0.0021	0.0021
12 months	0.0033	0.0011	0.0022
	Panel 12 : Sweden		
1 month	0.0248***	0.0106	0.0142***
3 months	0.0107	0.0084	0.0024
6 months	0.0073	0.0109	-0.0037
9 months	0.0069	0.0111	-0.0042
12 months	0.0083	0.0113	-0.0030
	Panel 13 : Netherlands		
1 month	0.0064	-0.0044	0.0108**
3 months	0.0032	-0.0044	0.0076**
6 months	0.0023	-0.0029	0.0052
9 months	0.0003	-0.0023	0.0025
12 months	0.0004	-0.0023	0.0027
	Panel 14 : Belgium		
1 month	0.0156***	-0.0036	0.0192***
3 months	0.0066***	-0.0057*	0.0122***
6 months	0.0017	-0.0033	0.0050*
9 months	0.0021	-0.0027	0.0047**
12 months	0.0017	-0.0022	0.0040*
	Panel 15 : Norway		
1 month	0.0073	-0.0139**	0.0205**
3 months	-0.0008	-0.0100**	0.0064
6 months	-0.0013	-0.0039	-0.0000
9 months	-0.0007	-0.0030	-0.0006
12 months	-0.0005	-0.0029	0.0010
	Panel 16 : Italy		
1 month	0.0094*	0.0032	0.0062*
3 months	0.0040	0.0050	-0.0010
6 months	0.0031	0.0047	-0.0016
9 months	0.0035	0.0032	0.0003
12 months	0.0029	0.0032	-0.0004
	Panel 17 : Finland		
1 month	0.0136***	-0.0023	0.0159***
3 months	0.0037	-0.0008	0.0046
6 months	0.0017	-0.0001	0.0018
9 months	0.0032	0.0001	0.0026
12 months	0.0027	-0.0003	0.0023
	Panel 18 : Austria		
1 month	0.0159***	-0.0111***	0.0270***
3 months	0.0069**	-0.0057**	0.0124***
6 months	0.0044*	-0.0052*	0.0088**
9 months	0.0039	-0.0034	0.0069**
12 months	0.0041	-0.0018	0.0059**
	Panel 19 : Denmark		
1 month	0.0050	0.0027	0.0027
3 months	-0.0020	0.0014	-0.0043
6 months	-0.0015	-0.0037	0.0010
9 months	-0.0019	-0.0029	-0.0003
12 months	-0.0022	-0.0032	-0.0006
	Panel 20 : Greece		
1 month	-0.0001	-0.0087	0.0106
3 months	-0.0077	-0.0114	0.0048
6 months	-0.0092	-0.0103	0.0051
9 months	-0.0115	-0.0073	0.0021
12 months	-0.0125	-0.0081	0.0036

Table XII. Media Premiums for Current Month Winners over Longer Holding Periods. This table reports the Carhart-alphas on equally weighted No minus High media coverage (No-High) portfolios formed among stocks in the highest current month return tercile. At the end of each month t we first sort all stocks into terciles according to their returns during month t. Within the high current month return tercile, we form portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. The High portfolio contains the stocks with media coverage higher than the median media coverage in month t. The portfolios are held from t to $t + k$, with $k = 1, 3, 6, 9, 12$ months (holding period). We use the overlapping portfolio approach of Jagadeesh and Titman (1993) to calculate the returns. Carhart-alpha estimates from regressing the monthly returns on the No, on the High and on the No-High portfolio on Carhart factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Holding Period	No Media	High Media	No-High
	Formation Period = 1 Month - Carhart Alphas		
Panel 1 : USA			
1 month	-0.0002	0.0019	-0.0021
3 months	0.0042**	0.0013	0.0029*
6 months	0.0047***	0.0017	0.0030*
9 months	0.0055***	0.0016	0.0039**
12 months	0.0054***	0.0018*	0.0036**
Panel 2 : Australia			
1 month	0.0157**	0.0247***	-0.0091***
3 months	0.0241***	0.0271***	-0.0029
6 months	0.0254***	0.0270***	-0.0016
9 months	0.0261***	0.0264***	-0.0003
12 months	0.0273***	0.0272***	0.0001
Panel 3 : Hongkong			
1 month	0.0024	-0.0010	0.0034
3 months	0.0022	-0.0058**	0.0080***
6 months	0.0013	-0.0064**	0.0077***
9 months	0.0008	-0.0070**	0.0078***
12 months	0.0004	-0.0064**	0.0068***
Panel 4 : Japan			
1 month	-0.0023	0.0018	-0.0041**
3 months	0.0005	0.0032***	-0.0027***
6 months	0.0008	0.0021**	-0.0012
9 months	0.0008	0.0024***	-0.0016*
12 months	0.0016*	0.0024***	-0.0008
Panel 5 : NewZealand			
1 month	-0.0086**	0.0079*	-0.0156***
3 months	0.0013	0.0085**	-0.0064**
6 months	0.0035	0.0083*	-0.0043
9 months	0.0045	0.0092**	-0.0036
12 months	0.0054	0.0078*	-0.0013
Panel 6 : Singapore			
1 month	-0.0094***	0.0069**	-0.0163***
3 months	-0.0023	0.0055**	-0.0078***
6 months	-0.0003	0.0031	-0.0034
9 months	-0.0011	0.0023	-0.0034
12 months	-0.0008	0.0024	-0.0031
Panel 7 : UK			
1 month	0.0131**	0.0152***	-0.0021
3 months	0.0135**	0.0143***	-0.0008
6 months	0.0141**	0.0147***	-0.0006
9 months	0.0142**	0.0152***	-0.0010
12 months	0.0146**	0.0160***	-0.0014
Panel 8 : Germany			
1 month	0.0096	0.0142**	-0.0046
3 months	0.0163**	0.0162**	0.0001
6 months	0.0181***	0.0174***	0.0008
9 months	0.0181***	0.0186***	-0.0005
12 months	0.0191***	0.0195***	-0.0004
Panel 9 : France			
1 month	0.0076	0.0099*	-0.0023
3 months	0.0126**	0.0126**	0.0001
6 months	0.0139**	0.0137***	0.0001
9 months	0.0149**	0.0144***	0.0006
12 months	0.0157***	0.0150***	0.0007
Panel 10 : Switzerland			
1 month	0.0128***	0.0152***	-0.0024
3 months	0.0152***	0.0140***	0.0012
6 months	0.0160***	0.0140***	0.0021
9 months	0.0158***	0.0146***	0.0012
12 months	0.0162***	0.0148***	0.0014

Table XII. Media Premiums for Current Month Winners over Longer Holding Periods - Continued

Holding Period	No Media	High Media	No-High
Formation Period = 1 Month - Carhart Alphas			
Panel 11 : Spain			
1 month	0.0093***	0.0021	0.0073**
3 months	0.0062*	0.0019	0.0043
6 months	0.0062**	0.0016	0.0046*
9 months	0.0053*	0.0017	0.0036
12 months	0.0053*	0.0022	0.0031
Panel 12 : Sweden			
1 month	0.0026	0.0111	-0.0085*
3 months	0.0100	0.0114	-0.0014
6 months	0.0122	0.0110	0.0012
9 months	0.0127	0.0115	0.0012
12 months	0.0138	0.0120	0.0018
Panel 13 : Netherlands			
1 month	0.0028	0.0049	-0.0021
3 months	0.0079***	0.0053*	0.0026
6 months	0.0063**	0.0041	0.0022
9 months	0.0069**	0.0035	0.0033
12 months	0.0077***	0.0043*	0.0034
Panel 14 : Belgium			
1 month	-0.0004	0.0029	-0.0033
3 months	0.0006	0.0039	-0.0033
6 months	0.0021	0.0023	-0.0002
9 months	0.0018	0.0020	-0.0003
12 months	0.0020	0.0017	0.0003
Panel 15 : Norway			
1 month	-0.0076	-0.0001	-0.0075*
3 months	0.0015	0.0001	0.0014
6 months	0.0014	-0.0000	0.0014
9 months	0.0007	-0.0005	0.0012
12 months	0.0009	-0.0004	0.0014
Panel 16 : Italy			
1 month	0.0024	0.0069	-0.0046
3 months	0.0042	0.0054	-0.0012
6 months	0.0048	0.0054	-0.0007
9 months	0.0058	0.0057	0.0001
12 months	0.0060	0.0066	-0.0007
Panel 17 : Finland			
1 month	-0.0090***	0.0031	-0.0123***
3 months	0.0010	0.0050	-0.0050*
6 months	0.0022	0.0038	-0.0026
9 months	0.0040	0.0041	-0.0014
12 months	0.0030	0.0042	-0.0019
Panel 18 : Austria			
1 month	0.0015	0.0071*	-0.0056
3 months	0.0041	-0.0002	0.0043
6 months	0.0052**	0.0011	0.0041
9 months	0.0046*	0.0013	0.0033
12 months	0.0047*	0.0014	0.0039
Panel 19 : Denmark			
1 month	-0.0030	0.0133**	-0.0167***
3 months	0.0003	0.0066	-0.0079**
6 months	0.0010	0.0048	-0.0057*
9 months	0.0011	0.0015	-0.0026
12 months	0.0016	0.0022	-0.0030
Panel 20 : Greece			
1 month	-0.0213***	-0.0169**	-0.0042
3 months	-0.0170**	-0.0111**	-0.0060
6 months	-0.0170**	-0.0138***	-0.0042
9 months	-0.0160**	-0.0115**	-0.0045
12 months	-0.0164**	-0.0114**	-0.0050

E Selected Double-Sort Results across Countries

Table XIII. Media Premiums Conditional on Market Value. This table reports the profitability of equally weighted No minus High media coverage (No-High) portfolio returns for subgroups of stocks sorted according to market capitalization. At the end of each month t we first sort all stocks into terciles according to their market value. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The portfolios are held during month $t+1$ and rebalanced monthly. Time-series means plus alpha estimates from regressing the monthly returns on the No-High portfolio on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Media Coverage	No-High		
MV	Low	Med	High
Panel 1 : USA			
TS Mean	-0.0017	-0.0044*	0.0018
CAPM Alpha	-0.0011	-0.0040*	0.0020
FF Alpha	-0.0007	-0.0049**	0.0010
CAR Alpha	-0.0011	-0.0050***	0.0008
Panel 2 : Australia			
TS Mean	0.0131	-0.0112	-0.0028
CAPM Alpha	0.0131	-0.0113	-0.0028
FF Alpha	0.0113	-0.0131	-0.0035
CAR Alpha	0.0160	-0.0131	-0.0026
Panel 3 : Hongkong			
TS Mean	0.0056	0.0031	0.0007
CAPM Alpha	0.0079	0.0049	0.0014
FF Alpha	0.0083	0.0064	-0.0001
CAR Alpha	0.0110	0.0053	-0.0016
Panel 4 : Japan			
TS Mean	0.0024	-0.0019	-0.0007
CAPM Alpha	0.0024	-0.0021	-0.0011
FF Alpha	0.0027	-0.0017	-0.0024*
CAR Alpha	0.0028	-0.0017	-0.0022**
Panel 5 : NewZealand			
TS Mean	0.0436**	-0.0056	-0.0052
CAPM Alpha	0.0442***	-0.0052	-0.0042
FF Alpha	0.0440***	-0.0040	-0.0061
CAR Alpha	0.0520***	-0.0027	-0.0078
Panel 6 : Singapore			
TS Mean	0.0098	0.0006	-0.0032
CAPM Alpha	0.0123*	0.0006	-0.0034
FF Alpha	0.0136*	-0.0017	-0.0034
CAR Alpha	0.0096	-0.0006	-0.0031
Panel 7 : UK			
TS Mean	0.0107**	-0.0022	-0.0002
CAPM Alpha	0.0110**	-0.0022	-0.0001
FF Alpha	0.0124**	-0.0034	0.0007
CAR Alpha	0.0114**	-0.0037	0.0012
Panel 8 : Germany			
TS Mean	0.0316**	0.0075	0.0025
CAPM Alpha	0.0312***	0.0074*	0.0025
FF Alpha	0.0250*	0.0028	0.0015
CAR Alpha	0.0249*	-0.0008	-0.0009

Table XIII. Media Premiums Conditional on Market Value. - Continued

Media Coverage	No-High		
MV	Low	Med	High
	Panel 9 : France		
TS Mean	0.0148**	0.0038	0.0031
CAPM Alpha	0.0145**	0.0029	0.0025
FF Alpha	0.0132*	0.0022	0.0012
CAR Alpha	0.0127*	0.0011	0.0011
	Panel 10 : Switzerland		
TS Mean	0.0093**	0.0079**	0.0046
CAPM Alpha	0.0090*	0.0076*	0.0042*
FF Alpha	0.0072	0.0064*	0.0039*
CAR Alpha	0.0064	0.0052	0.0031
	Panel 11 : Spain		
TS Mean	0.0109	0.0082*	0.0048
CAPM Alpha	0.0131*	0.0086**	0.0053
FF Alpha	0.0117	0.0088**	0.0061
CAR Alpha	0.0101	0.0069	0.0048
	Panel 12 : Sweden		
TS Mean	0.0119	0.0003	0.0025
CAPM Alpha	0.0121*	0.0005	0.0027
FF Alpha	0.0104	-0.0021	0.0035
vCAR Alpha	0.0119	-0.0038	0.0031
	Panel 13 : Netherlands		
TS Mean	0.0231***	0.0045	0.0048
CAPM Alpha	0.0248***	0.0049	0.0042
FF Alpha	0.0254***	0.0045	0.0010
CAR Alpha	0.0249***	0.0046	0.0009
	Panel 14 : Belgium		
TS Mean	0.0152*	0.0133***	0.0035
CAPM Alpha	0.0162*	0.0141***	0.0040*
FF Alpha	0.0127	0.0106***	0.0041*
CAR Alpha	0.0107	0.0086**	0.0030
	Panel 15 : Norway		
TS Mean	0.0103	0.0034	0.0015
CAPM Alpha	0.0117	0.0056	0.0036
FF Alpha	0.0084	0.0046	0.0032
CAR Alpha	0.0013	0.0008	0.0028
	Panel 16 : Italy		
TS Mean	0.0072	0.0013	-0.0019
CAPM Alpha	0.0064	0.0000	-0.0027
FF Alpha	0.0049	-0.0004	-0.0020
CAR Alpha	0.0033	-0.0003	-0.0021
	Panel 17 : Finland		
TS Mean	0.0091	0.0076	0.0021
CAPM Alpha	0.0091	0.0082*	0.0024
FF Alpha	0.0126	0.0052	-0.0002
CAR Alpha	0.0084	0.0031	-0.0047
	Panel 18 : Austria		
TS Mean	0.0186	0.0066	-0.0012
CAPM Alpha	0.0221*	0.0079	0.0026
FF Alpha	0.0226*	0.0063	0.0025
CAR Alpha	0.0215*	0.0061	0.0016
	Panel 19 : Denmark		
TS Mean	-0.0102	0.0012	-0.0057
CAPM Alpha	-0.0096	0.0013	-0.0053
FF Alpha	-0.0109	0.0028	-0.0075
CAR Alpha	-0.0053	0.0017	-0.0096**
	Panel 20 : Greece		
TS Mean	0.0333**	-0.0092	-0.0076
CAPM Alpha	0.0325**	-0.0084	-0.0065
FF Alpha	0.0327**	-0.0059	-0.0053
CAR Alpha	0.0400**	-0.0071	-0.0070

Table XIV. Media Premiums Conditional on Bid-Ask Spreads. This table reports the profitability of equally weighted No minus High media coverage (No-High) portfolio returns for subgroups of stocks sorted according to the bid-ask spread. At the end of each month t we first sort all stocks into terciles according to their bid-ask spread. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The portfolios are held during month $t+1$ and rebalanced monthly. Time-series means plus alpha estimates from regressing the monthly returns on the No-High portfolio on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Media Coverage		No-High	
Bid-Ask Spread	Low	Med	High
	Panel 1 : USA		
TS Mean	0.0036	0.0041*	0.0042
CAPM Alpha	0.0039*	0.0042*	0.0045*
FF Alpha	0.0002	0.0032	0.0048*
CAR Alpha	0.0000	0.0031	0.0046*
	Panel 2 : Australia		
TS Mean	-0.0021	-0.0001	0.0166
CAPM Alpha	-0.0022	-0.0000	0.0165
FF Alpha	-0.0031	-0.0019	0.0163
CAR Alpha	-0.0026	-0.0004	0.0144
	Panel 3 : Hongkong		
TS Mean	0.0049	0.0078**	0.0224***
CAPM Alpha	0.0054	0.0088**	0.0231***
FF Alpha	0.0035	0.0077**	0.0243***
CAR Alpha	0.0024	0.0055*	0.0236***
	Panel 4 : Japan		
TS Mean	0.0003	0.0026*	0.0034**
CAPM Alpha	-0.0001	0.0024*	0.0032**
FF Alpha	-0.0019	0.0022*	0.0029*
CAR Alpha	-0.0020	0.0022*	0.0029*
	Panel 5 : NewZealand		
TS Mean	-0.0076	0.0011	0.0220
CAPM Alpha	-0.0070	0.0007	0.0256**
FF Alpha	-0.0088	0.0006	0.0238*
CAR Alpha	-0.0083	-0.0029	0.0286**
	Panel 6 : Singapore		
TS Mean	-0.0021	0.0005	0.0029
CAPM Alpha	-0.0024	0.0003	0.0033
FF Alpha	-0.0014	-0.0001	0.0003
CAR Alpha	-0.0017	0.0000	-0.0016
	Panel 7 : UK		
TS Mean	0.0008	-0.0003	0.0105**
CAPM Alpha	0.0010	-0.0001	0.0107***
FF Alpha	0.0018	-0.0011	0.0110***
CAR Alpha	0.0023	-0.0013	0.0108***
	Panel 8 : Germany		
TS Mean	0.0011	0.0061	0.0265***
CAPM Alpha	0.0010	0.0060	0.0264***
FF Alpha	0.0002	0.0014	0.0224***
CAR Alpha	-0.0019	-0.0018	0.0192***

Table XIV. Media Premiums Conditional on Bid-Ask Spreads - Continued

Media Coverage	No-High		
Bid-Ask Spread	Low	Med	High
Panel 9 : France			
TS Mean	0.0112***	0.0031	0.0135*
CAPM Alpha	0.0107***	0.0026	0.0128**
FF Alpha	0.0096***	0.0021	0.0106*
CAR Alpha	0.0097***	0.0020	0.0098*
Panel 10 : Switzerland			
TS Mean	0.0027	0.0083**	0.0090**
CAPM Alpha	0.0023	0.0080**	0.0086**
FF Alpha	0.0023	0.0069**	0.0076**
CAR Alpha	0.0013	0.0063*	0.0063*
Panel 11 : Spain			
TS Mean	0.0040	0.0061	0.0069
CAPM Alpha	0.0059	0.0070*	0.0088*
FF Alpha	0.0064	0.0069**	0.0069*
CAR Alpha	0.0062	0.0073*	0.0067
Panel 12 : Sweden			
TS Mean	0.0031	0.0069	0.0015
CAPM Alpha	0.0034	0.0070*	0.0017
FF Alpha	0.0044	0.0056	0.0020
CAR Alpha	0.0057*	0.0067	0.0011
Panel 13 : Netherlands			
TS Mean	0.0196	0.0137***	0.0070
CAPM Alpha	0.0201*	0.0148***	0.0071
FF Alpha	0.0205	0.0147***	0.0068
CAR Alpha	0.0197*	0.0147***	0.0067
Panel 14 : Belgium			
TS Mean	0.0111**	0.0103***	0.0125**
CAPM Alpha	0.0118***	0.0110**	0.0138***
FF Alpha	0.0112***	0.0091***	0.0129***
CAR Alpha	0.0113***	0.0068**	0.0103**
Panel 15 : Norway			
TS Mean	0.0019	0.0138**	0.0133
CAPM Alpha	0.0034	0.0154***	0.0151**
FF Alpha	0.0034	0.0147**	0.0146**
CAR Alpha	0.0033	0.0119**	0.0142*
Panel 16 : Italy			
TS Mean	-0.0000	0.0034	0.0028
CAPM Alpha	-0.0012	0.0032	0.0022
FF Alpha	-0.0000	0.0045*	0.0013
CAR Alpha	0.0003	0.0056**	0.0000
Panel 17 : Finland			
TS Mean	-0.0019	0.0116***	0.0012
CAPM Alpha	-0.0013	0.0117***	0.0019
FF Alpha	-0.0051	0.0111***	0.0029
CAR Alpha	-0.0084**	0.0100**	0.0016
Panel 18 : Austria			
TS Mean	-0.0090*	0.0010	0.0278**
CAPM Alpha	-0.0013	0.0067	0.0259**
FF Alpha	-0.0014	0.0063	0.0252**
CAR Alpha	-0.0022	0.0059	0.0257**
Panel 19 : Denmark			
TS Mean	0.0007	0.0025	0.0107
CAPM Alpha	0.0012	0.0035	0.0111
FF Alpha	-0.0035	0.0030	0.0105
CAR Alpha	-0.0054	0.0005	0.0096
Panel 20 : Greece			
TS Mean	-0.0042	0.0015	0.0122
CAPM Alpha	-0.0037	0.0024	0.0128*
FF Alpha	-0.0021	0.0023	0.0131
CAR Alpha	-0.0005	0.0028	0.0129

Table XV. Media Premiums Conditional on Amihud's Illiquidity Ratio. This table reports the profitability of equally weighted No minus High media coverage (No-High) portfolio returns for subgroups of stocks sorted according to Amihud's illiquidity ratio. At the end of each month t we first sort all stocks into terciles according to Amihud's illiquidity ratio. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The portfolios are held during month $t+1$ and rebalanced monthly. Time-series means plus alpha estimates from regressing the monthly returns on the No-High portfolio on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Media Coverage		No-High	
Amihud's Illiquidity	Low	Med	High
	Panel 1 : USA		
TS Mean	0.0029*	-0.0038*	-0.0015
CAPM Alpha	0.0030**	-0.0036**	-0.0011
FF Alpha	0.0024*	-0.0038**	0.0002
CAR Alpha	0.0024*	-0.0037**	0.0005
	Panel 2 : Australia		
TS Mean	-0.0055**	0.0033	-0.0165
CAPM Alpha	-0.0055*	0.0033	-0.0167
FF Alpha	-0.0060**	0.0026	-0.0181
CAR Alpha	-0.0041*	0.0041	-0.0137
	Panel 3 : Hongkong		
TS Mean	-0.0019	0.0104**	0.0191**
CAPM Alpha	-0.0021	0.0114**	0.0211**
FF Alpha	-0.0037*	0.0109*	0.0197**
CAR Alpha	-0.0034*	0.0100*	0.0193**
	Panel 4 : Japan		
TS Mean	-0.0025	-0.0005	0.0023
CAPM Alpha	-0.0027*	-0.0006	0.0023*
FF Alpha	-0.0036***	-0.0008	0.0028*
CAR Alpha	-0.0036***	-0.0009	0.0028*
	Panel 5 : NewZealand		
TS Mean	-0.0051	-0.0095**	0.0274**
CAPM Alpha	-0.0051	-0.0091**	0.0295***
FF Alpha	-0.0061	-0.0101**	0.0240**
CAR Alpha	-0.0062	-0.0106**	0.0249**
	Panel 6 : Singapore		
TS Mean	-0.0100***	-0.0012	0.0018
CAPM Alpha	-0.0117***	-0.0010	0.0025
FF Alpha	-0.0075***	0.0004	-0.0050
CAR Alpha	-0.0066**	0.0021	-0.0098
	Panel 7 : UK		
TS Mean	-0.0040**	-0.0019	0.0090**
CAPM Alpha	-0.0039*	-0.0019	0.0092**
FF Alpha	-0.0026	-0.0022	0.0079*
CAR Alpha	-0.0016	-0.0018	0.0081*
	Panel 8 : Germany		
TS Mean	-0.0049*	0.0052	0.0021
CAPM Alpha	-0.0049**	0.0051	0.0017
FF Alpha	-0.0045*	0.0027	-0.0034
CAR Alpha	-0.0052**	0.0004	-0.0013

Table XV. Media Premiums Conditional on Amihud's Illiquidity Ratio- Continued

Media Coverage		No-High	
Amihud's Illiquidity	Low	Med	High
	Panel 9 : France		
TS Mean	-0.0000	0.0039	0.0096
CAPM Alpha	-0.0003	0.0036	0.0097
FF Alpha	-0.0008	0.0027	0.0097
CAR Alpha	-0.0005	0.0023	0.0102
	Panel 10 : Switzerland		
TS Mean	0.0034	0.0047	0.0035
CAPM Alpha	0.0031	0.0045	0.0033
FF Alpha	0.0028	0.0031	0.0028
CAR Alpha	0.0027	0.0022	0.0023
	Panel 11 : Spain		
TS Mean	0.0020	0.0049	0.0088
CAPM Alpha	0.0019	0.0050	0.0074
FF Alpha	0.0037	0.0049	0.0064
CAR Alpha	0.0037	0.0043	0.0040
	Panel 12 : Sweden		
TS Mean	0.0001	0.0015	0.0060
CAPM Alpha	0.0002	0.0017	0.0060
FF Alpha	0.0017	0.0013	0.0087
CAR Alpha	0.0031	0.0018	0.0101
	Panel 13 : Netherlands		
TS Mean	0.0062	0.0078**	0.0113*
CAPM Alpha	0.0039	0.0079*	0.0112*
FF Alpha	-0.0004	0.0076*	0.0110*
CAR Alpha	-0.0004	0.0075*	0.0110*
	Panel 14 : Belgium		
TS Mean	0.0059*	0.0018	0.0161**
CAPM Alpha	0.0063*	0.0024	0.0164**
FF Alpha	0.0043	0.0023	0.0148**
CAR Alpha	0.0043	0.0005	0.0161**
	Panel 15 : Norway		
TS Mean	0.0016	0.0005	0.0123
CAPM Alpha	0.0024	0.0019	0.0138
FF Alpha	0.0023	0.0003	0.0133
CAR Alpha	0.0043	-0.0038	0.0118
	Panel 16 : Italy		
TS Mean	-0.0005	0.0022	-0.0125
CAPM Alpha	-0.0013	0.0020	-0.0141
FF Alpha	0.0004	0.0031	-0.0160
CAR Alpha	0.0011	0.0031	-0.0157
	Panel 17 : Finland		
TS Mean	-0.0026	0.0046	0.0118
CAPM Alpha	-0.0023	0.0041	0.0121*
FF Alpha	-0.0049	0.0078*	0.0142**
CAR Alpha	-0.0080*	0.0082**	0.0108
	Panel 18 : Austria		
TS Mean	-0.0099**	0.0012	0.0178**
CAPM Alpha	-0.0066**	0.0019	0.0200*
FF Alpha	-0.0063*	0.0031	0.0191*
CAR Alpha	-0.0063*	0.0026	0.0206**
	Panel 19 : Denmark		
TS Mean	-0.0025	-0.0032	-0.0001
CAPM Alpha	-0.0023	-0.0028	-0.0005
FF Alpha	-0.0054	-0.0019	-0.0001
CAR Alpha	-0.0062	-0.0026	0.0010
	Panel 20 : Greece		
TS Mean	-0.0123**	0.0009	0.0210
CAPM Alpha	-0.0120**	0.0016	0.0207
FF Alpha	-0.0114**	-0.0005	0.0238
CAR Alpha	-0.0100	0.0030	0.0245

Table XVI. Media Premiums Conditional on Volume. This table reports the profitability of equally weighted No minus High media coverage (No-High) portfolio returns for subgroups of stocks sorted according to trading volume. At the end of each month t we first sort all stocks into terciles according to their trading volume. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The portfolios are held during month $t+1$ and rebalanced monthly. Time-series means plus alpha estimates from regressing the monthly returns on the No-High portfolio on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Media Coverage		No-High	
VAavgpastyear	Low	Med	High
	Panel 1 : USA		
TS Mean	-0.0030	-0.0037**	0.0013
CAPM Alpha	-0.0027	-0.0036**	0.0011
FF Alpha	-0.0017	-0.0031**	0.0017
CAR Alpha	-0.0017	-0.0031**	0.0017
	Panel 2 : Australia		
TS Mean	0.0016	-0.0058	-0.0064**
CAPM Alpha	0.0018	-0.0058	-0.0065*
FF Alpha	0.0016	-0.0053	-0.0069**
CAR Alpha	0.0037	-0.0050	-0.0058*
	Panel 3 : Hongkong		
TS Mean	0.0056	0.0025	-0.0042
CAPM Alpha	0.0064	0.0029	-0.0047
FF Alpha	0.0084	0.0033	-0.0066***
CAR Alpha	0.0085	0.0034	-0.0079***
	Panel 4 : Japan		
TS Mean	-0.0007	-0.0016	-0.0032*
CAPM Alpha	-0.0006	-0.0016	-0.0031
FF Alpha	-0.0004	-0.0011	-0.0038***
CAR Alpha	-0.0004	-0.0011	-0.0038***
	Panel 5 : NewZealand		
TS Mean	0.0200	0.0008	-0.0094**
CAPM Alpha	0.0195	0.0023	-0.0095**
FF Alpha	0.0136	0.0019	-0.0098**
CAR Alpha	0.0138	0.0024	-0.0111**
	Panel 6 : Singapore		
TS Mean	0.0038	-0.0013	-0.0103***
CAPM Alpha	0.0037	-0.0028	-0.0123***
FF Alpha	-0.0029	-0.0008	-0.0079**
CAR Alpha	-0.0067	0.0003	-0.0071**
	Panel 7 : UK		
TS Mean	0.0046	0.0011	-0.0027
CAPM Alpha	0.0048	0.0011	-0.0027
FF Alpha	0.0048	0.0013	-0.0011
CAR Alpha	0.0054	0.0016	0.0002
	Panel 8 : Germany		
TS Mean	0.0162	0.0047	-0.0051*
CAPM Alpha	0.0157	0.0046	-0.0051**
FF Alpha	0.0102	0.0020	-0.0043**
CAR Alpha	0.0125	-0.0002	-0.0044**

Table XVI. **Media Premiums Conditional on Volume -Continued**

Media Coverage	No-High		
VAavgpastyear	Low	Med	High
	Panel 9 : France		
TS Mean	0.0180***	0.0057	0.0004
CAPM Alpha	0.0178***	0.0054*	0.0001
FF Alpha	0.0189***	0.0048	0.0000
CAR Alpha	0.0194***	0.0045	0.0003
	Panel 10 : Switzerland		
TS Mean	0.0041	0.0054*	0.0029
CAPM Alpha	0.0039	0.0052**	0.0027
FF Alpha	0.0037	0.0041	0.0027
CAR Alpha	0.0025	0.0034	0.0026
	Panel 11 : Spain		
TS Mean	0.0070	0.0068*	0.0124*
CAPM Alpha	0.0081	0.0067	0.0125
FF Alpha	0.0057	0.0060	0.0141
CAR Alpha	0.0030	0.0050	0.0144*
	Panel 12 : Sweden		
TS Mean	-0.0006	-0.0032	-0.0002
CAPM Alpha	-0.0006	-0.0029	-0.0002
FF Alpha	-0.0001	-0.0036	0.0022
CAR Alpha	0.0013	-0.0029	0.0023
	Panel 13 : Netherlands		
TS Mean	0.0113	0.0076*	0.0116
CAPM Alpha	0.0110	0.0080**	0.0097
FF Alpha	0.0104	0.0081**	-0.0001
CAR Alpha	0.0102	0.0081**	-0.0007
	Panel 14 : Belgium		
TS Mean	0.0142	0.0088***	0.0037
CAPM Alpha	0.0143*	0.0093***	0.0041
FF Alpha	0.0123	0.0085***	0.0024
CAR Alpha	0.0145*	0.0071**	0.0020
	Panel 15 : Norway		
TS Mean	0.0070	0.0023	-0.0014
CAPM Alpha	0.0091	0.0029	-0.0009
FF Alpha	0.0060	0.0030	-0.0009
CAR Alpha	-0.0021	0.0006	-0.0006
	Panel 16 : Italy		
TS Mean	-0.0014	0.0030	-0.0027
CAPM Alpha	-0.0017	0.0031	-0.0029
FF Alpha	-0.0024	0.0042	-0.0003
CAR Alpha	-0.0033	0.0039	0.0006
	Panel 17 : Finland		
TS Mean	0.0116	0.0029	-0.0023
CAPM Alpha	0.0117	0.0025	-0.0021
FF Alpha	0.0140*	0.0060	-0.0039
CAR Alpha	0.0072	0.0054	-0.0079*
	Panel 18 : Austria		
TS Mean	0.0211***	0.0121	-0.0100**
CAPM Alpha	0.0190**	0.0136*	-0.0072*
FF Alpha	0.0197**	0.0149*	-0.0070*
CAR Alpha	0.0195**	0.0152*	-0.0072*
	Panel 19 : Denmark		
TS Mean	-0.0080	0.0052	-0.0032
CAPM Alpha	-0.0083	0.0055	-0.0030
FF Alpha	-0.0067	0.0062	-0.0057
CAR Alpha	-0.0041	0.0060	-0.0061
	Panel 20 : Greece		
TS Mean	0.0042	0.0020	-0.0149**
CAPM Alpha	0.0042	0.0022	-0.0144***
FF Alpha	0.0123	-0.0023	-0.0141**
CAR Alpha	0.0099	0.0004	-0.0133**

Table XVII. Media Premiums Conditional on Price. This table reports the profitability of equally weighted No minus High media coverage (No-High) portfolio returns for subgroups of stocks sorted according to Price. At the end of each month t we first sort all stocks into terciles according to their price. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The portfolios are held during month $t+1$ and rebalanced monthly. Time-series means plus alpha estimates from regressing the monthly returns on the No-High portfolio on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Media Coverage	No-High		
Pusd	Low	Med	High
Panel 1 : USA			
TS Mean	-0.0020	-0.0055**	-0.0014
CAPM Alpha	-0.0015	-0.0050**	-0.0013
FF Alpha	-0.0008	-0.0061**	-0.0031**
CAR Alpha	-0.0011	-0.0063***	-0.0031**
Panel 2 : Australia			
TS Mean	0.0221**	-0.0025	-0.0105***
CAPM Alpha	0.0217**	-0.0026	-0.0105***
FF Alpha	0.0211**	-0.0043	-0.0119***
CAR Alpha	0.0240***	-0.0060	-0.0111***
Panel 3 : Hongkong			
TS Mean	0.0098	0.0017	-0.0031
CAPM Alpha	0.0106	0.0036	-0.0015
FF Alpha	0.0103	0.0044	-0.0029
CAR Alpha	0.0086	0.0021	-0.0051***
Panel 4 : Japan			
TS Mean	0.0023	-0.0026*	0.0008
CAPM Alpha	0.0020	-0.0031**	0.0006
FF Alpha	0.0035**	-0.0021*	-0.0012
CAR Alpha	0.0036***	-0.0020*	-0.0012
Panel 5 : NewZealand			
TS Mean	0.0168	-0.0137*	-0.0022
CAPM Alpha	0.0183*	-0.0130*	-0.0015
FF Alpha	0.0186	-0.0149	-0.0016
CAR Alpha	0.0156	-0.0129	-0.0035
Panel 6 : Singapore			
TS Mean	0.0128**	-0.0099**	-0.0052**
CAPM Alpha	0.0141**	-0.0085**	-0.0044**
FF Alpha	0.0115*	-0.0095*	-0.0040*
CAR Alpha	0.0068	-0.0089*	-0.0039*
Panel 7 : UK			
TS Mean	-0.0017	-0.0061**	-0.0038*
CAPM Alpha	-0.0014	-0.0059**	-0.0036
FF Alpha	-0.0007	-0.0057*	-0.0025
CAR Alpha	-0.0020	-0.0065**	-0.0018
Panel 8 : Germany			
TS Mean	0.0214***	0.0002	0.0044
CAPM Alpha	0.0213***	0.0000	0.0043
FF Alpha	0.0169***	-0.0011	0.0022
CAR Alpha	0.0145**	-0.0047	-0.0000

Table XVII. Media Premiums Conditional on Price - Continued

Media Coverage	No-High		
Pusd	Low	Med	High
	Panel 9 : France		
TS Mean	0.0132**	-0.0007	0.0053
CAPM Alpha	0.0124**	-0.0014	0.0046**
FF Alpha	0.0117**	-0.0022	0.0027*
CAR Alpha	0.0101**	-0.0026	0.0030*
	Panel 10 : Switzerland		
TS Mean	0.0046	0.0037	0.0056**
CAPM Alpha	0.0041	0.0033	0.0053**
FF Alpha	0.0038	0.0036	0.0049**
CAR Alpha	0.0035	0.0033	0.0040*
	Panel 11 : Spain		
TS Mean	0.0068	0.0026	0.0050
CAPM Alpha	0.0074*	0.0037	0.0057*
FF Alpha	0.0070**	0.0049	0.0054*
CAR Alpha	0.0060*	0.0037	0.0054*
	Panel 12 : Sweden		
TS Mean	0.0114*	-0.0098**	-0.0043
CAPM Alpha	0.0118**	-0.0095***	-0.0041
FF Alpha	0.0116*	-0.0095***	-0.0012
CAR Alpha	0.0114*	-0.0102***	-0.0011
	Panel 13 : Netherlands		
TS Mean	0.0087	0.0093**	0.0051
CAPM Alpha	0.0082	0.0093**	0.0060**
FF Alpha	0.0086*	0.0084**	0.0049*
CAR Alpha	0.0084*	0.0083**	0.0049*
	Panel 14 : Belgium		
TS Mean	0.0173***	0.0008	0.0119***
CAPM Alpha	0.0183***	0.0016	0.0132***
FF Alpha	0.0200***	0.0012	0.0090***
CAR Alpha	0.0182***	0.0003	0.0087***
	Panel 15 : Norway		
TS Mean	0.0070	0.0004	-0.0019
CAPM Alpha	0.0092	0.0016	0.0022
FF Alpha	0.0083	0.0016	0.0012
CAR Alpha	0.0038	0.0003	0.0017
	Panel 16 : Italy		
TS Mean	-0.0007	-0.0011	-0.0037
CAPM Alpha	-0.0010	-0.0022	-0.0051*
FF Alpha	-0.0011	-0.0006	-0.0032
CAR Alpha	-0.0014	-0.0004	-0.0026
	Panel 17 : Finland		
TS Mean	0.0031	0.0043	0.0044
CAPM Alpha	0.0037	0.0049	0.0050
FF Alpha	0.0046	0.0030	0.0037
CAR Alpha	0.0030	0.0018	0.0001
	Panel 18 : Austria		
TS Mean	0.0063	-0.0025	0.0077
CAPM Alpha	0.0094	0.0013	0.0114**
FF Alpha	0.0101	0.0005	0.0110**
CAR Alpha	0.0079	0.0008	0.0113**
	Panel 19 : Denmark		
TS Mean	-0.0011	-0.0030	-0.0032
CAPM Alpha	-0.0004	-0.0018	-0.0025
FF Alpha	0.0015	-0.0043	-0.0068
CAR Alpha	-0.0006	-0.0063	-0.0085*
	Panel 20 : Greece		
TS Mean	0.0065	-0.0070	-0.0119**
CAPM Alpha	0.0081	-0.0053	-0.0107**
FF Alpha	0.0112	-0.0018	-0.0092*
CAR Alpha	0.0031	-0.0045	-0.0093

Table XVIII. Media Premiums Conditional on Past Year Return. This table reports the profitability of equally weighted No minus High media coverage (No-High) portfolio returns for subgroups of stocks sorted according to Past Year Return. At the end of each month t we first sort all stocks into terciles according to their return over the past year. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The portfolios are held during month $t+1$ and rebalanced monthly. Time-series means plus alpha estimates from regressing the monthly returns on the No-High portfolio on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Media Coverage	No-High		
RETpastyear	Low	Med	High
Panel 1 : USA			
TS Mean	0.0018	0.0027	0.0101***
CAPM Alpha	0.0023	0.0029	0.0103***
FF Alpha	0.0005	0.0009	0.0094***
CAR Alpha	0.0002	0.0008	0.0095***
Panel 2 : Australia			
TS Mean	0.0151***	0.0046	0.0054
CAPM Alpha	0.0149***	0.0045	0.0054
FF Alpha	0.0128***	0.0026	0.0037
CAR Alpha	0.0109**	0.0031	0.0052
Panel 3 : Hongkong			
TS Mean	0.0135***	0.0080*	0.0143***
CAPM Alpha	0.0151***	0.0096*	0.0151***
FF Alpha	0.0136***	0.0082**	0.0115***
CAR Alpha	0.0111***	0.0050	0.0110***
Panel 4 : Japan			
TS Mean	0.0030	0.0010	0.0041***
CAPM Alpha	0.0027	0.0007	0.0039**
FF Alpha	0.0018	0.0003	0.0030**
CAR Alpha	0.0020	0.0004	0.0029**
Panel 5 : NewZealand			
TS Mean	0.0037	-0.0102*	0.0065*
CAPM Alpha	0.0027	-0.0090	0.0074**
FF Alpha	0.0012	-0.0103	0.0076*
CAR Alpha	0.0029	-0.0107	0.0092**
Panel 6 : Singapore			
TS Mean	-0.0052	0.0002	0.0044
CAPM Alpha	-0.0050	0.0000	0.0046
FF Alpha	-0.0063	-0.0000	0.0041
CAR Alpha	-0.0051	-0.0004	0.0037
Panel 7 : UK			
TS Mean	-0.0039	-0.0043*	0.0034*
CAPM Alpha	-0.0035	-0.0040**	0.0036*
FF Alpha	-0.0021	-0.0030*	0.0036**
CAR Alpha	-0.0026	-0.0026*	0.0049***
Panel 8 : Germany			
TS Mean	0.0190***	0.0049	0.0056
CAPM Alpha	0.0189***	0.0048	0.0056*
FF Alpha	0.0167***	0.0039	0.0037
CAR Alpha	0.0141***	0.0017	0.0030

Table XVIII. Media Premiums Conditional on Past Year Return - Continued

Media Coverage	No-High		
RETpastyear	Low	Med	High
	Panel 9 : France		
TS Mean	0.0076*	0.0028	0.0101***
CAPM Alpha	0.0068**	0.0023	0.0098***
FF Alpha	0.0057**	0.0015	0.0087***
CAR Alpha	0.0052*	0.0015	0.0093***
	Panel 10 : Switzerland		
TS Mean	0.0013	0.0046	0.0071***
CAPM Alpha	0.0009	0.0042	0.0069***
FF Alpha	0.0006	0.0043*	0.0068***
CAR Alpha	0.0002	0.0041	0.0069***
	Panel 11 : Spain		
TS Mean	0.0041	-0.0004	0.0100***
CAPM Alpha	0.0053	-0.0001	0.0115***
FF Alpha	0.0049	0.0013	0.0123***
CAR Alpha	0.0038	0.0010	0.0122***
	Panel 12 : Sweden		
TS Mean	0.0022	0.0041	-0.0020
CAPM Alpha	0.0027	0.0042	-0.0018
FF Alpha	0.0056	0.0068*	-0.0018
CAR Alpha	0.0029	0.0071**	0.0012
	Panel 13 : Netherlands		
TS Mean	-0.0034	0.0091**	0.0120**
CAPM Alpha	-0.0041	0.0096***	0.0126***
FF Alpha	-0.0052	0.0091***	0.0128***
CAR Alpha	-0.0054	0.0091***	0.0130***
	Panel 14 : Belgium		
TS Mean	0.0075	0.0026	0.0091***
CAPM Alpha	0.0089**	0.0033	0.0097***
FF Alpha	0.0092**	0.0016	0.0088***
CAR Alpha	0.0072*	0.0022	0.0071**
	Panel 15 : Norway		
TS Mean	0.0092	0.0026	0.0004
CAPM Alpha	0.0106	0.0049	0.0027
FF Alpha	0.0101	0.0042	0.0023
CAR Alpha	0.0074	0.0037	0.0028
	Panel 16 : Italy		
TS Mean	0.0064	-0.0009	-0.0008
CAPM Alpha	0.0058	-0.0017	-0.0019
FF Alpha	0.0089**	-0.0010	-0.0020
CAR Alpha	0.0088**	-0.0012	-0.0009
	Panel 17 : Finland		
TS Mean	0.0068	0.0079*	0.0046
CAPM Alpha	0.0072	0.0086**	0.0052
FF Alpha	0.0063	0.0074**	0.0058
CAR Alpha	0.0060	0.0064	0.0031
	Panel 18 : Austria		
TS Mean	0.0106	0.0012	0.0061
CAPM Alpha	0.0116**	0.0037	0.0108**
FF Alpha	0.0127**	0.0025	0.0104**
CAR Alpha	0.0120**	0.0026	0.0111***
	Panel 19 : Denmark		
TS Mean	0.0040	-0.0018	-0.0067
CAPM Alpha	0.0046	-0.0008	-0.0060
FF Alpha	0.0046	-0.0023	-0.0081*
CAR Alpha	0.0004	-0.0055*	-0.0080*
	Panel 20 : Greece		
TS Mean	0.0087	0.0008	-0.0055
CAPM Alpha	0.0095	0.0014	-0.0047
FF Alpha	0.0117	0.0037	-0.0028
CAR Alpha	0.0121	0.0058	-0.0020

F Media Effect and Market States: Double-Sort Results

Table XIX. Conditional Strategy Returns in the U.S. This table reports the profitability of equally weighted portfolio returns for subgroups of stocks. At the end of each month t we first sort all stocks into terciles according to firm characteristics. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The market state in a given month is considered good/bullish (bad/bearish), if the percentage of stocks with positive (negative) returns during that month exceeds 50%. Following good (bad) market state months, we go long (short) the No-Coverage and short (long) the High-Coverage portfolio. The portfolios are held during month $t + 1$ and rebalanced monthly. Alpha estimates from regressing the resulting monthly returns on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Tercile	CAPM Alpha	FF Alpha	Carhart Alpha
Panel 1: By MVyearlyavg			
1	0.0071*	0.0064*	0.0061*
2	0.0021	0.0016	0.0014
3	-0.0014	-0.0011	-0.0013
Panel 2: By MTBVyearly			
1	0.0051**	0.0056**	0.0055**
2	0.0015	0.0017	0.0016
3	0.0072***	0.0070***	0.0070***
Panel 3: By RETpastyear			
1	0.0086***	0.0091***	0.0091***
2	0.0063***	0.0067***	0.0067***
3	0.0051***	0.0045***	0.0045***
Panel 4: By RETcurrentmonth			
1	0.0074***	0.0075***	0.0075***
2	0.0059***	0.0060***	0.0059***
3	0.0072***	0.0067***	0.0065**
Panel 5: By Pavgpast			
1	0.0070***	0.0075***	0.0071***
2	0.0022	0.0023	0.0022
3	-0.0012	-0.0017	-0.0018
Panel 6: By BidAskSpread			
1	0.0046**	0.0042**	0.0041**
2	0.0040*	0.0039**	0.0039**
3	0.0054**	0.0057**	0.0056**
Panel 7: By VAavgpastyear			
1	-0.0003	0.0002	0.0002
2	0.0018	0.0017	0.0017
3	-0.0030	-0.0029	-0.0027
Panel 8: By Amihud			
1	-0.0018	-0.0019	-0.0020
2	0.0032*	0.0029*	0.0027*
3	0.0045	0.0040	0.0038

Table XX. Conditional Strategy Returns in Australia. This table reports the profitability of equally weighted portfolio returns for subgroups of stocks. At the end of each month t we first sort all stocks into terciles according to firm characteristics. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The market state in a given month is considered good/bullish (bad/bearish), if the percentage of stocks with positive (negative) returns during that month exceeds 50%. Following good (bad) market state months, we go long (short) the No-Coverage and short (long) the High-Coverage portfolio. The portfolios are held during month $t + 1$ and rebalanced monthly. Alpha estimates from regressing the resulting monthly returns on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Tercile	CAPM Alpha	FF Alpha	Carhart Alpha
	Panel 1: By MVyearlyavg		
1	0.0098	0.0099	0.0103
2	0.0068	0.0069	0.0058
3	0.0080***	0.0079***	0.0079***
	Panel 2: By MTBVyearly		
1	0.0113***	0.0114***	0.0119***
2	0.0128***	0.0132***	0.0138***
3	0.0087**	0.0087**	0.0088**
	Panel 3: By RETpastyear		
1	0.0185***	0.0188***	0.0197***
2	0.0118***	0.0122***	0.0132***
3	0.0095***	0.0095***	0.0097***
	Panel 4: By RETcurrentmonth		
1	0.0082	0.0079*	0.0096**
2	0.0126***	0.0129***	0.0131***
3	0.0157***	0.0162***	0.0166***
	Panel 5: By Pavgpast		
1	0.0486**	0.0478**	0.0534**
2	0.0009	0.0013	0.0008
3	0.0081***	0.0081***	0.0083***
	Panel 6: By BidAskSpread		
1	0.0074***	0.0073***	0.0075***
2	0.0073	0.0077	0.0086
3	0.0158	0.0143	0.0163
	Panel 7: By VAavgpastyear		
1	0.0048	0.0039	0.0040
2	0.0101	0.0081	0.0095
3	0.0088***	0.0083***	0.0081**
	Panel 8: By Amihud		
1	0.0086***	0.0083***	0.0085***
2	0.0012	0.0005	0.0016
3	0.0280*	0.0278*	0.0287*

Table XXI. Conditional Strategy Returns in Hongkong. This table reports the profitability of equally weighted portfolio returns for subgroups of stocks. At the end of each month t we first sort all stocks into terciles according to firm characteristics. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The market state in a given month is considered good/bullish (bad/bearish), if the percentage of stocks with positive (negative) returns during that month exceeds 50%. Following good (bad) market state months, we go long (short) the No-Coverage and short (long) the High-Coverage portfolio. The portfolios are held during month $t+1$ and rebalanced monthly. Alpha estimates from regressing the resulting monthly returns on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Tercile	CAPM Alpha	FF Alpha	Carhart Alpha
Panel 1: By MVyearlyavg			
1	-0.0017	-0.0007	-0.0017
2	-0.0011	-0.0019	-0.0034
3	0.0047*	0.0058**	0.0054**
Panel 2: By MTBVyearly			
1	0.0011	-0.0019	-0.0023
2	0.0064	0.0075**	0.0056*
3	0.0111***	0.0112***	0.0128***
Panel 3: By RETpastyear			
1	0.0056	0.0055	0.0064
2	0.0141**	0.0145***	0.0137***
3	0.0100**	0.0093***	0.0087***
Panel 4: By RETcurrentmonth			
1	0.0080*	0.0086**	0.0077***
2	0.0109***	0.0099***	0.0107***
3	0.0128**	0.0114**	0.0108**
Panel 5: By Pavgpast			
1	-0.0010	0.0034	0.0033
2	-0.0000	-0.0009	-0.0021
3	0.0034	0.0041*	0.0038*
Panel 6: By BidAskSpread			
1	0.0134***	0.0135***	0.0125***
2	0.0048	0.0051	0.0054
3	-0.0070	-0.0082	-0.0089
Panel 7: By VAavgpastyear			
1	0.0033	0.0051	0.0051
2	0.0049	0.0025	0.0023
3	0.0113***	0.0124***	0.0118***
Panel 8: By Amihud			
1	0.0083***	0.0091***	0.0083***
2	0.0022	0.0003	-0.0007
3	0.0036	0.0046	0.0032

Table XXII. Conditional Strategy Returns in Japan. This table reports the profitability of equally weighted portfolio returns for subgroups of stocks. At the end of each month t we first sort all stocks into terciles according to firm characteristics. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The market state in a given month is considered good/bullish (bad/bearish), if the percentage of stocks with positive (negative) returns during that month exceeds 50%. Following good (bad) market state months, we go long (short) the No-Coverage and short (long) the High-Coverage portfolio. The portfolios are held during month $t+1$ and rebalanced monthly. Alpha estimates from regressing the resulting monthly returns on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Tercile	CAPM Alpha	FF Alpha	Carhart Alpha
Panel 1: By MVyearlyavg			
1	0.0019	0.0027*	0.0026*
2	0.0006	0.0009	0.0009
3	0.0001	0.0012	0.0013
Panel 2: By MTBVyearly			
1	0.0014	-0.0012	-0.0015
2	0.0034	0.0043	0.0045
3	0.0028	0.0036	0.0039
Panel 3: By RETpastyear			
1	0.0013	0.0018	0.0018
2	0.0026**	0.0028**	0.0028**
3	0.0042***	0.0053***	0.0054***
Panel 4: By RETcurrentmonth			
1	0.0023*	0.0040***	0.0041***
2	0.0025**	0.0030**	0.0031***
3	0.0028*	0.0028	0.0029*
Panel 5: By Pavgpast			
1	0.0037**	0.0036**	0.0036**
2	0.0027*	0.0031**	0.0030**
3	0.0036*	0.0042**	0.0043**
Panel 6: By BidAskSpread			
1	0.0020	0.0031**	0.0031**
2	0.0017	0.0023	0.0024*
3	0.0033**	0.0042**	0.0043**
Panel 7: By VAavgpastyear			
1	0.0016	0.0021*	0.0021*
2	0.0004	0.0007	0.0007
3	0.0016	0.0020	0.0022
Panel 8: By Amihud			
1	0.0010	0.0019	0.0021
2	0.0002	0.0003	0.0003
3	0.0023*	0.0031**	0.0031**

Table XXIII. Conditional Strategy Returns in New Zealand. This table reports the profitability of equally weighted portfolio returns for subgroups of stocks. At the end of each month t we first sort all stocks into terciles according to firm characteristics. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The market state in a given month is considered good/bullish (bad/bearish), if the percentage of stocks with positive (negative) returns during that month exceeds 50%. Following good (bad) market state months, we go long (short) the No-Coverage and short (long) the High-Coverage portfolio. The portfolios are held during month $t + 1$ and rebalanced monthly. Alpha estimates from regressing the resulting monthly returns on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Tercile	CAPM Alpha	FF Alpha	Carhart Alpha
Panel 1: By MVyearlyavg			
1	0.0025	-0.0011	0.0052
2	0.0029	0.0037	0.0021
3	0.0056	0.0070	0.0067
Panel 2: By MTBVyearly			
1	0.0339	0.0414	0.0446
2	0.0079*	0.0071*	0.0072*
3	-0.0002	0.0008	-0.0010
Panel 3: By RETpastyear			
1	0.0148**	0.0131*	0.0094
2	0.0099*	0.0119*	0.0126*
3	-0.0025	-0.0030	-0.0030
Panel 4: By RETcurrentmonth			
1	0.0069	0.0058	0.0057
2	0.0130	0.0186**	0.0194**
3	0.0085*	0.0088**	0.0085*
Panel 5: By Pavgpast			
1	0.0101	0.0068	0.0088
2	0.0123	0.0152	0.0153
3	0.0022	0.0029	0.0024
Panel 6: By BidAskSpread			
1	0.0089*	0.0099*	0.0090
2	0.0042	0.0031	0.0033
3	0.0015	0.0018	-0.0093
Panel 7: By VAavgpastyear			
1	0.0117	0.0107	0.0113
2	0.0025	0.0030	0.0014
3	0.0089*	0.0095*	0.0100
Panel 8: By Amihud			
1	0.0067	0.0072	0.0067
2	0.0032	0.0037	0.0039
3	0.0004	-0.0034	-0.0052

Table XXIV. Conditional Strategy Returns in Singapore. This table reports the profitability of equally weighted portfolio returns for subgroups of stocks. At the end of each month t we first sort all stocks into terciles according to firm characteristics. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The market state in a given month is considered good/bullish (bad/bearish), if the percentage of stocks with positive (negative) returns during that month exceeds 50%. Following good (bad) market state months, we go long (short) the No-Coverage and short (long) the High-Coverage portfolio. The portfolios are held during month $t+1$ and rebalanced monthly. Alpha estimates from regressing the resulting monthly returns on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Tercile	CAPM Alpha	FF Alpha	Carhart Alpha
	Panel 1: By MVyearlyavg		
1	-0.0098	-0.0124	-0.0123
2	-0.0009	0.0018	0.0019
3	- 0.0041**	0.0032	0.0037*
	Panel 2: By MTBVyearly		
1	-0.0035	-0.0013	-0.0010
2	0.0174***	0.0136***	0.0147***
3	0.0096	0.0057	0.0063
	Panel 3: By RETpastyear		
1	0.0063	0.0099**	0.0094**
2	0.0022	0.0008	0.0014
3	0.0014	0.0009	0.0014
	Panel 4: By RETcurrentmonth		
1	0.0012	0.0014	0.0021
2	0.0043	0.0038	0.0040
3	0.0074**	0.0070**	0.0067**
	Panel 5: By Pavgpast		
1	0.0016	0.0007	0.0030
2	-0.0048	-0.0055	-0.0055
3	-0.0001	0.0002	0.0004
	Panel 6: By BidAskSpread		
1	0.0026	0.0015	0.0024
2	0.0061*	0.0050	0.0063
3	-0.0002	0.0009	0.0018
	Panel 7: By VAavgpastyear		
1	0.0064	0.0142	0.0159
2	0.0012	0.0020	0.0019
3	0.0063**	0.0018	0.0027
	Panel 8: By Amihud		
1	0.0072***	0.0035	0.0045
2	-0.0054	-0.0044	-0.0068
3	0.0064	0.0067	0.0107

Table XXV. Conditional Strategy Returns in the UK. This table reports the profitability of equally weighted portfolio returns for subgroups of stocks. At the end of each month t we first sort all stocks into terciles according to firm characteristics. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The market state in a given month is considered good/bullish (bad/bearish), if the percentage of stocks with positive (negative) returns during that month exceeds 50%. Following good (bad) market state months, we go long (short) the No-Coverage and short (long) the High-Coverage portfolio. The portfolios are held during month $t+1$ and rebalanced monthly. Alpha estimates from regressing the resulting monthly returns on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Tercile	CAPM Alpha	FF Alpha	Carhart Alpha
	Panel 1: By MVyearlyavg		
1	-0.0076*	-0.0074	-0.0071
2	0.0048*	0.0056**	0.0057**
3	0.0047**	0.0045**	0.0041*
	Panel 2: By MTBVyearly		
1	0.0092***	0.0078***	0.0084***
2	0.0078***	0.0073***	0.0073***
3	0.0112***	0.0109***	0.0112***
	Panel 3: By RETpastyear		
1	0.0077*	0.0068*	0.0078*
2	0.0078***	0.0076***	0.0078***
3	0.0017	0.0024	0.0021
	Panel 4: By RETcurrentmonth		
1	0.0049	0.0038	0.0043
2	0.0129***	0.0133***	0.0138***
3	0.0060**	0.0063**	0.0058**
	Panel 5: By Pavgpast		
1	-0.0006	-0.0002	0.0006
2	0.0041	0.0034	0.0049
3	0.0049**	0.0049**	0.0052**
	Panel 6: By BidAskSpread		
1	0.0050**	0.0050**	0.0054**
2	0.0028	0.0034	0.0038
3	-0.0030	-0.0029	-0.0020
	Panel 7: By VAavgpastyear		
1	-0.0053	-0.0050	-0.0045
2	0.0021	0.0021	0.0017
3	0.0066***	0.0061***	0.0060***
	Panel 8: By Amihud		
1	0.0055***	0.0052**	0.0052**
2	0.0037	0.0038	0.0032
3	-0.0115***	-0.0107***	-0.0104**

Table XXVI. Conditional Strategy Returns in Germany. This table reports the profitability of equally weighted portfolio returns for subgroups of stocks. At the end of each month t we first sort all stocks into terciles according to firm characteristics. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The market state in a given month is considered good/bullish (bad/bearish), if the percentage of stocks with positive (negative) returns during that month exceeds 50%. Following good (bad) market state months, we go long (short) the No-Coverage and short (long) the High-Coverage portfolio. The portfolios are held during month $t+1$ and rebalanced monthly. Alpha estimates from regressing the resulting monthly returns on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Tercile	CAPM Alpha	FF Alpha	Carhart Alpha
	Panel 1: By MVyearlyavg		
1	0.0200*	0.0227*	0.0231*
2	-0.0037	-0.0005	0.0001
3	0.0013	0.0036	0.0057*
	Panel 2: By MTBVyearly		
1	0.0091	0.0128	0.0152*
2	0.0010	0.0022	0.0050*
3	-0.0006	0.0028	0.0050
	Panel 3: By RETpastyear		
1	0.0036	0.0068	0.0099*
2	-0.0010	0.0006	0.0028
3	-0.0002	0.0014	0.0026
	Panel 4: By RETcurrentmonth		
1	-0.0074	-0.0049	-0.0023
2	0.0012	0.0035	0.0052*
3	0.0074**	0.0092**	0.0106**
	Panel 5: By Pavgpast		
1	0.0049	0.0077	0.0091
2	0.0001	0.0016	0.0045
3	-0.0004	0.0029	0.0050
	Panel 6: By BidAskSpread		
1	0.0001	0.0021	0.0046
2	0.0028	0.0059	0.0080
3	-0.0069	-0.0035	-0.0017
	Panel 7: By VAavgpastyear		
1	0.0064	0.0102	0.0069
2	0.0012	0.0021	0.0027
3	0.0068**	0.0077**	0.0097***
	Panel 8: By Amihud		
1	0.0054*	0.0070**	0.0089***
2	0.0001	0.0010	0.0011
3	0.0158	0.0196	0.0156

Table XXVII. Conditional Strategy Returns in France. This table reports the profitability of equally weighted portfolio returns for subgroups of stocks. At the end of each month t we first sort all stocks into terciles according to firm characteristics. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The market state in a given month is considered good/bullish (bad/bearish), if the percentage of stocks with positive (negative) returns during that month exceeds 50%. Following good (bad) market state months, we go long (short) the No-Coverage and short (long) the High-Coverage portfolio. The portfolios are held during month $t+1$ and rebalanced monthly. Alpha estimates from regressing the resulting monthly returns on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Tercile	CAPM Alpha	FF Alpha	Carhart Alpha
Panel 1: By MVyearlyavg			
1	-0.0049	-0.0044	-0.0051
2	-0.0024	-0.0028	-0.0025
3	0.0068***	0.0072***	0.0074***
Panel 2: By MTBVyearly			
1	0.0036	0.0049	0.0049
2	0.0083***	0.0088***	0.0086***
3	0.0076**	0.0081***	0.0080***
Panel 3: By RETpastyear			
1	0.0103***	0.0113***	0.0113***
2	0.0065***	0.0068***	0.0067***
3	0.0061***	0.0062***	0.0061***
Panel 4: By RETcurrentmonth			
1	0.0048	0.0056*	0.0053*
2	0.0066***	0.0070***	0.0071***
3	0.0084***	0.0084***	0.0084***
Panel 5: By Pavgpast			
1	0.0050	0.0062	0.0057
2	0.0078***	0.0082***	0.0085***
3	0.0055**	0.0060**	0.0060**
Panel 6: By BidAskSpread			
1	0.0115***	0.0121***	0.0122***
2	0.0038*	0.0036	0.0036
3	-0.0072	-0.0073	-0.0068
Panel 7: By VAavgpastyear			
1	0.0057	0.0063	0.0064
2	-0.0012	-0.0005	-0.0005
3	0.0087***	0.0090***	0.0091***
Panel 8: By Amihud			
1	0.0093***	0.0096***	0.0097***
2	-0.0021	-0.0020	-0.0021
3	-0.0028	-0.0041	-0.0045

Table XXVIII. Conditional Strategy Returns in Switzerland. This table reports the profitability of equally weighted portfolio returns for subgroups of stocks. At the end of each month t we first sort all stocks into terciles according to firm characteristics. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The market state in a given month is considered good/bullish (bad/bearish), if the percentage of stocks with positive (negative) returns during that month exceeds 50%. Following good (bad) market state months, we go long (short) the No-Coverage and short (long) the High-Coverage portfolio. The portfolios are held during month $t+1$ and rebalanced monthly. Alpha estimates from regressing the resulting monthly returns on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Tercile	CAPM Alpha	FF Alpha	Carhart Alpha
Panel 1: By MVyearlyavg			
1	0.0030	0.0024	0.0035
2	-0.0028	-0.0021	-0.0011
3	0.0049*	0.0058**	0.0065**
Panel 2: By MTBVyearly			
1	0.0019	0.0022	0.0030
2	0.0006	0.0006	0.0023
3	0.0089***	0.0090***	0.0096***
Panel 3: By RETpastyear			
1	0.0062*	0.0057	0.0075**
2	0.0076***	0.0075***	0.0081***
3	0.0017	0.0022	0.0031
Panel 4: By RETcurrentmonth			
1	0.0061*	0.0070**	0.0083**
2	0.0054*	0.0047*	0.0056**
3	0.0064**	0.0067**	0.0078***
Panel 5: By Pavgpast			
1	0.0097***	0.0105***	0.0123***
2	0.0071***	0.0069***	0.0081***
3	0.0009	0.0003	0.0009
Panel 6: By BidAskSpread			
1	0.0065**	0.0067**	0.0079**
2	0.0035	0.0044	0.0057**
3	-0.0015	-0.0004	0.0004
Panel 7: By VAavgpastyear			
1	-0.0021	-0.0020	-0.0020
2	0.0007	0.0021	0.0026
3	0.0031	0.0044	0.0051*
Panel 8: By Amihud			
1	0.0035	0.0043*	0.0050**
2	-0.0006	0.0015	0.0021
3	-0.0033	-0.0033	-0.0023

Table XXIX. Conditional Strategy Returns in Spain. This table reports the profitability of equally weighted portfolio returns for subgroups of stocks. At the end of each month t we first sort all stocks into terciles according to firm characteristics. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The market state in a given month is considered good/bullish (bad/bearish), if the percentage of stocks with positive (negative) returns during that month exceeds 50%. Following good (bad) market state months, we go long (short) the No-Coverage and short (long) the High-Coverage portfolio. The portfolios are held during month $t+1$ and rebalanced monthly. Alpha estimates from regressing the resulting monthly returns on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Tercile	CAPM Alpha	FF Alpha	Carhart Alpha
	Panel 1: By MVyearlyavg		
1	-0.0065	-0.0059	-0.0051
2	-0.0032	-0.0036	-0.0031
3	0.0049	0.0037	0.0040
	Panel 2: By MTBVyearly		
1	-0.0027	-0.0042	-0.0033
2	0.0028	0.0029	0.0026
3	0.0102***	0.0102***	0.0100***
	Panel 3: By RETpastyear		
1	-0.0009	-0.0003	-0.0008
2	0.0045	0.0044	0.0048
3	0.0015	0.0014	0.0019
	Panel 4: By RETcurrentmonth		
1	0.0064**	0.0056*	0.0061*
2	-0.0011	-0.0013	-0.0018
3	0.0041	0.0042	0.0043
	Panel 5: By Pavgpast		
1	0.0011	0.0007	0.0008
2	0.0032	0.0027	0.0030
3	0.0021	0.0020	0.0021
	Panel 6: By BidAskSpread		
1	0.0081**	0.0064**	0.0064*
2	0.0017	0.0018	0.0019
3	-0.0072	-0.0063	-0.0069
	Panel 7: By VAavgpastyear		
1	-0.0101*	-0.0100*	-0.0086
2	-0.0032	-0.0025	-0.0018
3	0.0011	-0.0009	-0.0015
	Panel 8: By Amihud		
1	-0.0001	-0.0027	-0.0026
2	-0.0063	-0.0055	-0.0053
3	-0.0120	-0.0108	-0.0119

Table XXX. Conditional Strategy Returns in Sweden. This table reports the profitability of equally weighted portfolio returns for subgroups of stocks. At the end of each month t we first sort all stocks into terciles according to firm characteristics. Within each of the resulting terciles, we form three portfolios based on media coverage. The No portfolio consists of stocks that have no media coverage during month t. Covered stocks are divided into two portfolios: Low (High) contains the stocks with media coverage lower (higher) than the median media coverage in month t. The market state in a given month is considered good/bullish (bad/bearish), if the percentage of stocks with positive (negative) returns during that month exceeds 50%. Following good (bad) market state months, we go long (short) the No-Coverage and short (long) the High-Coverage portfolio. The portfolios are held during month $t+1$ and rebalanced monthly. Alpha estimates from regressing the resulting monthly returns on widely accepted risk factors are presented. 2-sided p-values from Newey-West standard errors using 6 lags are represented by * signs. * denotes 10%, ** denotes 5% and *** denotes 1% significance levels.

Tercile	CAPM Alpha	FF Alpha	Carhart Alpha
Panel 1: By MVyearlyavg			
1	0.0079	0.0057	0.0058
2	-0.0016	-0.0013	-0.0009
3	0.0052*	0.0055*	0.0050*
Panel 2: By MTBVyearly			
1	0.0000	0.0009	0.0010
2	0.0115**	0.0117**	0.0113*
3	0.0066	0.0056	0.0075*
Panel 3: By RETpastyear			
1	0.0103*	0.0101	0.0102
2	0.0098***	0.0094**	0.0085*
3	0.0039	0.0029	0.0042
Panel 4: By RETcurrentmonth			
1	-0.0051	-0.0048	-0.0040
2	0.0094***	0.0096***	0.0088**
3	0.0140***	0.0136**	0.0130**
Panel 5: By Pavgpast			
1	0.0105	0.0117	0.0116
2	0.0068	0.0069	0.0056
3	0.0025	0.0018	0.0025
Panel 6: By BidAskSpread			
1	0.0027	0.0012	0.0013
2	-0.0000	0.0009	0.0021
3	0.0045	0.0034	0.0045
Panel 7: By VAavgpastyear			
1	0.0036	0.0021	0.0029
2	0.0026	0.0042	0.0051
3	0.0039	0.0045	0.0041
Panel 8: By Amihud			
1	0.0063*	0.0064*	0.0068*
2	-0.0022	-0.0009	-0.0010
3	0.0055	0.0026	0.0037

Why does Myopic Loss Aversion Help to Explain the Equity Premium Puzzle?

Abstract

In this study, I examine one of the widely-accepted explanations for the equity premium puzzle, referred to as *Myopic Loss Aversion* by Benartzi and Thaler (1995). Their study shows that for a myopically loss averse agent equity returns are not too large compared to riskfree asset returns considering solely the return distributions in isolation from consumption. In this paper, I revisit and verify their results by employing a more recent data sample. Following the same methodology, I show that a constant relative risk aversion utility function can also explain the equity premium puzzle with reasonably low risk aversion. As a consequence, the core assumption that drives the results of Benartzi and Thaler (1995) seems to be the isolation of the consumption dynamics and hence of consumption risk from the portfolio choice problem as opposed to the choice of utility function. My results provide evidence against the validity of *Myopic Loss Aversion* as a potential explanation to the equity premium puzzle.

KEYWORDS: Equity premium puzzle, prospect theory, myopic loss aversion

1 Introduction

The equity premium puzzle, as pointed out by Grossman and Shiller (1981) and Mehra and Prescott (1985), corresponds to the fact that historical equity returns are too large, relative to riskfree rates, to be explained by the conventional theory of inter-temporal consumption and investment models of Lucas (1978) and Breeden (1979a). In these frameworks, the risk premium is modeled by the covariance term between excess stock returns and consumption growth. The smoothness of the growth of consumption data (resulting in very low covariance values) requires the model to have unrealistically high risk aversion levels to explain the high equity returns. More precisely, Mehra and Prescott (1985) show that in order to rationalize the historical equity premiums, the (representative) CRRA utility function must have a risk aversion coefficient of around 40. The study also presents an extensive literature on estimates of the risk aversion coefficient of a constant relative risk aversion (CRRA) function. Various studies focused on estimating risk aversion coefficients of individuals employing different models and different consumption and investment data. The average estimate of the risk aversion coefficient is shown to be very small around 1 between $0 - 2.5$ (Mehra and Prescott, 1985). In fact, various experimental studies confirmed this result by estimating relatively small risk aversion coefficients. For example, Barsky, Juster, Kimball, and Shapiro (1997) give the relative risk aversion coefficient of 3.22 as the average elicited value using answers to lottery type questions. The low values of estimated risk aversion coefficients of individuals contradict the implications of the consumption-based asset pricing of a risk aversion value around 40. Therefore, the large historical equity premiums are concluded to be an empirical asset pricing puzzle in the finance literature (see for a detailed review Campbell, 2003).

Even if one ignores that the high risk aversion coefficients are implausible, assuming very strong risk aversion coefficients leads to very high interest rates. As a consequence, explaining high equity returns with high risk aversion gives rise to the risk-free rate puzzle. An extensive review of literature is provided and discussed thoroughly in Campbell (2003) and Mehra (2007).

Myopic loss aversion, suggested by Benartzi and Thaler (1995) provides one of the potential explanations for the equity premium puzzle. The study states that for a loss averse investor with annual portfolio evaluation frequency the observed equity premiums cannot be considered as too large. More precisely, in the study the representative agent is assumed to have (linear) prospect theory preferences with loss aversion. They infer the optimal portfolio evaluation frequency so that portfolio returns - at this evaluation frequency - are equally attractive to the agent. Using simulations, their study illustrates the fact that a prospect theory agent with annual evaluation frequency finds the riskfree asset and equity approximately equally attractive given the empirical distributions. For this purpose, they employ two approaches. In the first approach, equity and riskfree asset are evaluated with a prospect theory value function at different evaluation frequencies as well as different parameterization. In an attempt to compare the attractiveness of the equity and riskfree asset returns, they argue for the irrelevance of probability weighting and curvature coefficients of the prospect theory value function and conclude that the loss aversion and evaluation frequency are the fundamental variables in this context. As a reliability check, their second approach consists in allowing the agent to allocate his portfolio with the risky and riskfree assets, the objective being to find the allocation that yields the highest prospect theory value.

In this study, I revisit the *Myopic Loss Aversion* argument of Benartzi and Thaler (1995) to explain the equity premium puzzle. I apply the same methodology but on a more much recent dataset and find that their results still hold. I show that parametric inferences in this context can be done by calibrating the portfolio problem of the agent to obtain the required level of loss aversion such that optimal weight in the risky asset is around 50%. By imposing an annual evaluation frequency, I calibrate the values of parameters that can lead to the indifference between the risky and riskfree asset (with a resulting portfolio allocation of $50-50$) of the prospect theory agent.

However, I find the argument of the prospect theory value function questionable when it comes to really explaining the equity premium puzzle. To analyze the impact of the shape of the utility function, I implement the same methodology and employ a conventional CRRA utility function with the same evaluation frequency. I demonstrate that a CRRA agent with a risk-aversion coefficient of 3.55 can also explain the equity premium puzzle in the same way that the prospect theory does. My results provide evidence for the fact that an arbitrary conventional utility function with sufficient and realistically low curvature may potentially lead to the same conclusion. This implies that the isolation of consumption dynamics by neglecting the other sources of consumption risk seems to be the core of this explanation. Considering the consumption dynamics of a CRRA agent, Mehra and Prescott (1985) illustrated the existence of the equity premium puzzle. After neglecting consumption risk and income effects, it seems that the puzzling nature of Equity Premiums does not arise at all. In fact, the solution of equity premium puzzle by neglecting consumption dynamics has been already addressed in the literature. For example, St-Amour (2005) demonstrates this point by modeling utility of wealth in the portfolio selection problem. Similarly, Merton (1969) models the portfolio choice of an agent by neglecting consumption dynamics and derives a closed-form formula for the optimal portfolio weight of the risky asset for a CRRA agent. Hence, by considering the result of Merton (1969), I additionally verify my findings regarding the CRRA explanation on a theoretical basis. Even though the strict distributional assumptions in Merton (1969) for the risky and riskfree asset returns could be unconvincing, a risk-aversion coefficient of 4 results in 50% of optimal weight in the risky asset. Merton (1969) assumes that risky asset has lognormal returns and risk-free asset yield constant return, which may be indeed questionable given the empirical properties of data. Nonetheless, the required risk aversion level of 4 seems to be still rather low and relatively close to the empirically calibrated risk aversion value of 3.55 in this study, and doubtlessly much lower than the required risk aversion levels addressed in the models of Mehra and Prescott (1985).

The remainder of the paper is organized as follows. In the next section, I explain the data and calibration methodology regarding the equivalence and inferences on parameters. In the third section, I present the results and discuss their implications. In the fourth section, the critical discussion regarding prospect theory and its role in explaining equity premium puzzle is provided and finally, the last section gives the conclusion.

2 Data and Methodology

The data used in this study is the yearly data of value weighted market returns including dividends and short term risk-free rates from the data library of Kenneth French over the time period of January 1927 and December 2013. The return data on the market is the value-weighted return on all NYSE, AMEX, and NASDAQ stocks. I slightly deviate from the original paper of Benartzi and Thaler (1995) and use the short-term Treasure Bill rates as a riskfree rate[78]. Table I presents the descriptive statistics for the annual data employed in this study. Similar to the literature, the equity premium is observed to be around 8% and the standard deviation of the market is around 20% annually.

Table I Descriptive statistics of the yearly market and riskfree asset returns. All numbers are presented in percentages.

	Mean	Std. Dev	Skewness	Kurtosis	Min	Max
Market Equity	11.89	20.47	-0.43	2.92	-44.21	57.03
T-Bill	3.54	3.13	0.98	3.85	-0.04	14.72

In the study of Benartzi and Thaler (1995), the potential solution to the equity premium puzzle is achieved by finding the reasonable evaluation frequency for a (simplified) prospect theory agent. This means that at the specified portfolio evaluation frequency, a myopically loss averse agent finds the risky and riskfree asset equally attractive and invests equally given the return distributions. The argument for the solution is based on the fact that if the representative agent finds the risky asset returns too attractive relative to riskfree asset returns, then he would invest his total wealth in the risky portfolio optimally. However, when the agent does not invest fully in the risky asset, this implies that risky asset returns are not much more attractive compared to the riskfree asset returns. Their study shows that a prospect theory agent with reasonable parameters finds the two assets equally attractive given their empirical distributions. To avoid concerns regarding potential diversification effects on the result, they also show optimal prospective value of the portfolio of returns with changing weights in risky and risk free asset.

Unlike Benartzi and Thaler (1995), I fix the evaluation frequency of returns to yearly, as this is roughly concluded to be the reasonable evaluation frequency in their study. I mainly focus on

[78]The reason of the deviation from the the data of the original paper is that I do not have access to the bond returns data over the desired time period. However, I have done the analysis with observations on a limited time period and find that the results do not change significantly. As in the case of Benartzi and Thaler (1995) the inferred loss aversion levels may be estimated slightly lower than presented in the present study.

analyzing the effects of a prospect theory value function and its parametric specifications.

Similar to Benartzi and Thaler (1995), I employ the prospect theory value function of Kahneman and Tversky (1992) as the preference function for the representative agent to evaluate the prospective utility of portfolios. The prospect theory is expressed as follows in its general form:

$$v(x) = \begin{cases} x^{\alpha_1} & if \quad x \geq 0 \\ -\lambda\,(-x)^{\alpha_2} & if \quad x < 0 \end{cases} \quad \text{and } p\omega(p) = \frac{p^{\gamma}}{(p^{\gamma} + (1-p)^{\gamma})^{1/\gamma}}, \tag{2.1}$$

where x represents gains and losses (not the wealth level), λ denotes the loss aversion coefficient, α_1 and α_2 represent the curvature parameters for gains and losses respectively. Finally γ stands for the probability weighting coefficient. In the study of Kahneman and Tversky (1979, 1992), estimates for the parameter values are $\alpha_2 = \alpha_1 = 0.88$ and $\lambda = 2.25$ in the piecewise power value function, $\gamma \sim 0.65$ in the weighting functions by employing data from the laboratory experiments on decision making under uncertainty[79]. Prospective value or expected prospect theory value is computed as

$$PT(X) = \sum_{i=1}^{n} p\omega_i(p_i)v(x_i) \tag{2.2}$$

where X represents a single asset or a portfolio gross return. When there is no probability weighting, the function reduces to a linear function of probabilities, $p\omega_i(p_i) = p_i$ representing the corresponding probabilities. In this case, the prospective utility is exactly in the same form as the expected utility function. Although I write the general formulation of prospect theory here, I follow Benartzi and Thaler (1995) and employ the simplified linear version in this study. In this case, parameters are assumed to be $\alpha_2 = \alpha_1 = \gamma = 1$ and only the loss aversion λ is the free parameter. I denote by PT_λ this simplified version of the prospect theory function.

Moreover, I also perform the portfolio approach to examine the potential diversification effects. For this purpose, I optimize prospective utility value over the weight in risky asset in his portfolio similarly to Benartzi and Thaler (1995). The portfolio problem of the prospect theory agent when the financial markets contain one risky and one riskfree asset can be expressed as follows:

$$w^* \in \arg\max \; PT_\lambda(R_p) \;\; \text{s.t.} \;\; R_p = wR + (1-w)R_f \tag{2.3}$$

where w denotes the weight in the risky asset, R and R_f represent the return on the risky asset and and riskfree asset, respectively. $w*$ represents the optimal portfolio weight of risky asset and is a decreasing function of λ. The simplified version of prospect theory results in a concave

[79]In the study of Kahneman and Tversky (1979, 1992) the probability weighting coefficients for gains and losses are estimated slightly differently between $0.60 - 0.70$. However I neglect this point in this study following methodology of Benartzi and Thaler (1995)

function, and this implies that, as a rough measure of curvature, loss aversion λ punishes higher risk, resulting in higher loss aversion λ decreasing the weight of risky asset w. This will ensure the convergence of the optimization problem given in Equation (2.4). Then the required parametric inference on the loss aversion λ can be achieved by a simple calibration on the optimal weight of the risky asset being close to 50%. Formally, this can be expressed as follows:

$$\begin{aligned} &\min_{\lambda} \ (w^*(\lambda) - 0.5)^2\,, \text{ s.t. } \lambda \in [1, \infty), \text{ and} \\ &w^*(\lambda) \in \arg\max \ PT_\lambda(R_p) \ \text{ s.t. } \ R_p = wR + (1-w)R_f. \end{aligned} \tag{2.4}$$

Moreover, to analyze the effect of the shape of the utility function in this context, I replace the utility function with a standard concave utility function and repeat the analysis. For this I choose a CRRA utility function $u_\alpha(x) = x^{1-\alpha}/(1-\alpha)$ and I analyze the effects of the risk aversion coefficient on the results. In this context, the expected utility of a CRRA with risk aversion α can be expressed as follows:

$$EU_\alpha(X) = \sum_{i=1}^{n} p_i u_\alpha(x_i), \tag{2.5}$$

and the optimal portfolio weight maximizing the expected utility is:

$$w^* \in \arg\max \ EU_\alpha(R_p) \ \text{ s.t. } \ R_p = wR + (1-w)R_f \tag{2.6}$$

where EU stands for expected utility function and u_α represents the CRRA utility function with risk aversion coefficient of α. In this case, the calibration of the required risk aversion level can be formally expressed as:

$$\begin{aligned} &\min_{\alpha} \ (w^*(\alpha) - 0.5)^2\,, \text{ s.t. } \alpha \in [0, \infty), \text{ and} \\ &w^* \in \arg\max \ EU_\alpha(R_p) \ \text{ s.t. } \ R_p = wR + (1-w)R_f. \end{aligned} \tag{2.7}$$

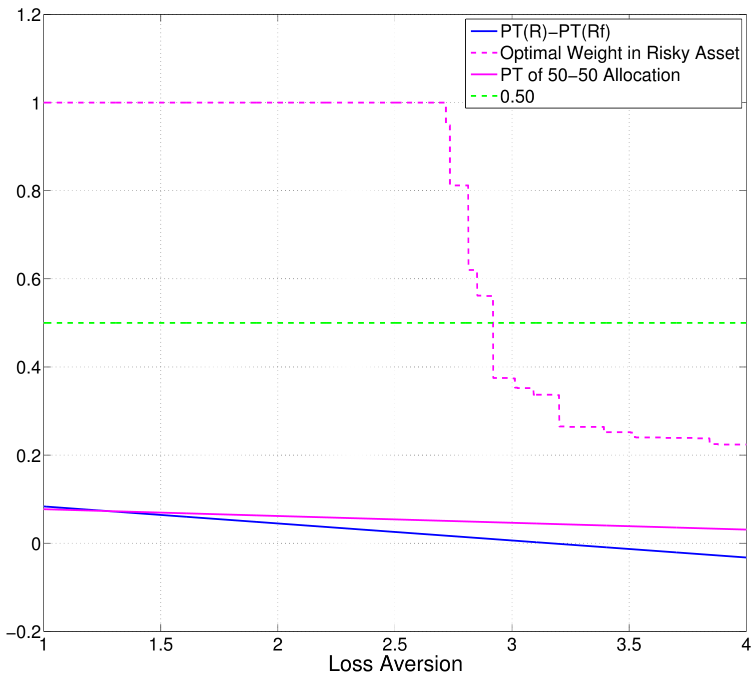
where w denotes the weight in the risky asset, R and R_f represent the return on the risky asset and and riskfree asset, respectively. $w*$ represents the optimal portfolio weight of risky asset and is a decreasing function of α. For a concave utility function with risk aversion parameter α as a measure of curvature, α punishes higher risk, resulting in higher risk aversion α decreasing the weight of risky asset w. This will ensure the convergence of the optimization problem given in Equation 2.7.

3 Results

I follow the methodology of Benartzi and Thaler (1995) and verify their findings on a slightly different dataset: I employ more recent data over a longer period of time, specifically over the time period of January 1927 and December 2013, and I use short-term T-Bill rates as the riskfree rates.

I illustrate the effect of the loss aversion λ on prospective values (expected prospect theory values) of risky vs. riskfree asset, portfolio of $50-50$ allocation and the optimal weight in the risky asset in Figure 1. At the first glance, one realizes that comparing the prospective values of risky and riskfree asset separately results in higher required loss aversion compared to the required loss aversion for the optimal weight of the risky asset around 0.50. The former is depicted as the blue line for the difference of prospective value of risky asset over the prospective value of riskfree asset. The line crosses the zero axis around a 3.16 value of loss aversion. On the other hand, an optimal weight in the risky asset of around 0.50 is obtained for the loss

Figure 1. The figure presents the effect of loss aversion coefficient on the attractiveness of risky and riskfree asset returns, portfolio of $50-50$ allocation and the optimal weight in the risky asset. For the calculations, the prospect theory utility function is simplified to be linear in gains and losses without probability weighting to remain comparable to Benartzi and Thaler (1995).



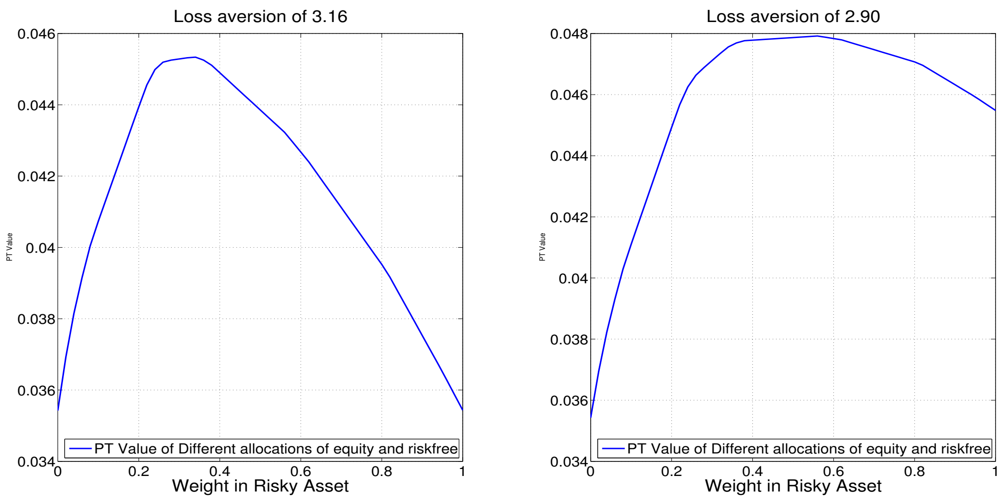
aversion value of 2.90. This shows that the empirical correlation between the two assets causes a lower portfolio risk potentially because of the effect of hedging, hence lowering the required loss aversion value.

More precisely, solving for the required loss aversion λ in the optimization problem given in Equation 2.4, I obtain that the minimum is achieved at $\lambda \in [2.88, 2.92]$ with an optimal weight for the risky asset of $w* = 0.56$.

Benartzi and Thaler (1995) conclude that a prospect theory agent with a loss aversion of 2.77 finds the risky and riskfree assets equally attractive. In this case, optimal allocation of the wealth is approximately around $50-50$ between risky and riskfree asset. By employing a longer timer series and short-term bonds instead of long-term bonds as risk-free returns in comparing the attractiveness of the two assets, I find that a loss aversion value around 3.16 provides similar results. However, optimizing the prospect theory value of a portfolio for an agent with loss aversion of 3.16, I find that the maximum is achieved at around 30% of weight in the risky asset as demonstrated in the first chart of Figure 2.

Focusing on the loss aversion value of 2.90 I obtain via calibrating (2.4), I demonstrate that the optimal portfolio weight in risky asset is indeed 50%. The effects of the portfolio weight for

Figure 2. The figure presents the effect of weight in risky asset on the resulting prospective value of the portfolio. Prospect theory utility function in this case is assumed to be linear in gains and losses and no probability weighting to remain comparable to Benartzi and Thaler (1995). Highest statistical significance for equivalence is achieved at the loss aversion value of 3.16 as shown in Figure 1. The first figure employs this the value in the linear prospect theory value function. Around 50% optimal weight in the risky asset is achieved for the loss aversion value of 2.90. The second figure employs this the value in the linear prospect theory value function.



the risky asset on prospective value of the total portfolio is demonstrated in Figure 2.

Roughly speaking, a prospect theory value function with increasing loss aversion makes the functional form effectively more concave. This implies that despite its piecewise linear form, the utility function seems to capture a usual concavity effect. Hence, the explanation may hold independent of particular functional specifications but depending on the level of curvature. To test this premise, I analyze whether the result holds for any other utility function. I consider s CRRA utility function of the form $u(x) = x^{1-\alpha}/1 - \alpha$ ceteris paribus. Instead of the loss aversion, I analyze the effect of the risk aversion coefficient of α following exactly the same methodology as Benartzi and Thaler (1995).

Figure 3 demonstrates the effect of risk aversion α on the expected utilities of the risky compared to the riskfree asset, expected utility of a $50-50$ allocation between risky and riskfree asset and the optimal portfolio weight in the risky asset. Comparing the expected utilities of the risky and riskfree assets separately also results in a higher required risk aversion compared to the required risk aversion for the optimal weight of the risky asset around 0.50. The difference in the expected utility values of the risky over the riskfree asset is illustrated by the blue line. The line crosses the zero axis around a 3.50 value for the loss aversion. On the other hand, the optimal weight in the risky asset of around 0.50 seems to be obtained for the risk aversion values of between $3.60 - 3.90$.

Figure 3. The figure presents the effect of the risk aversion coefficient of a CRRA utility function on the attractiveness of risky and riskfree asset returns, following exactly the same methodology as Benartzi and Thaler (1995).

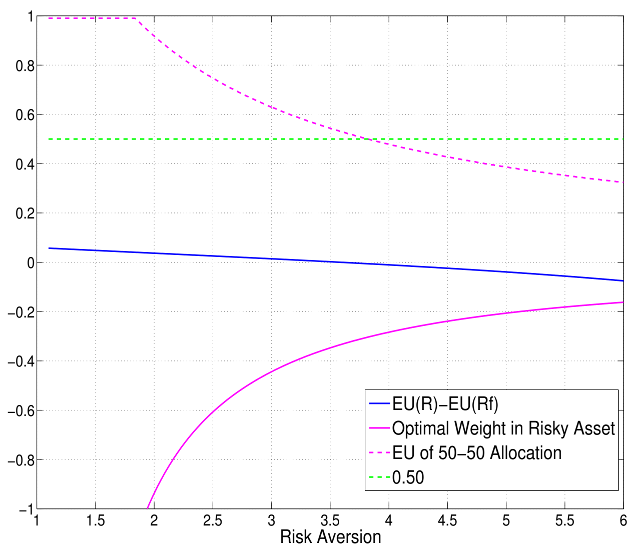
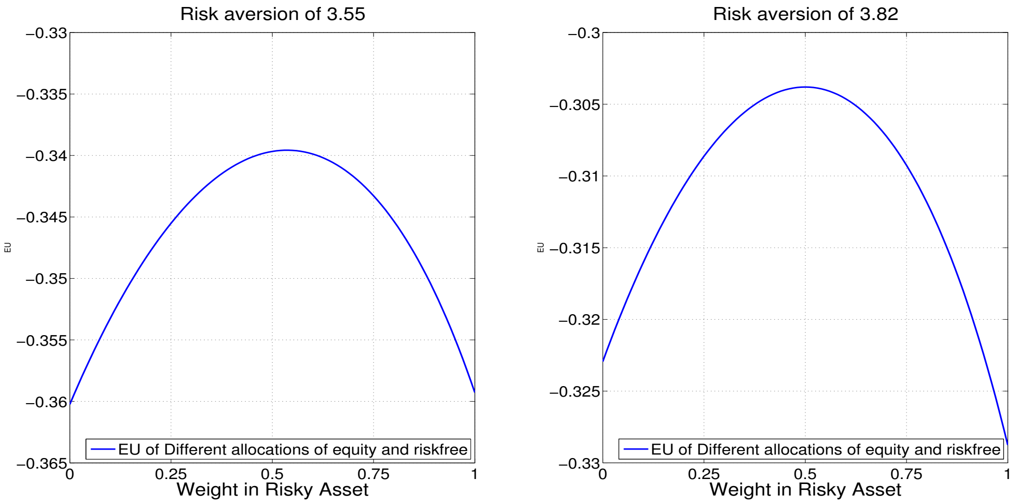


Figure 4. The figure presents the effect of weight allocated to the risky asset on the resulting expected utility of the portfolio. Utility function in this case is assumed to be of CRRA type. In the figure, the two charts illustrates the expected utilities that are computed with the risk aversion value of $\alpha = 3.55$ and $\alpha = 3.82$ respectively for the different portfolio allocations.



Solving the optimization problem given in Equation 2.7 for the calibration of required risk aversion α, I find that the minimum is achieved at $\alpha \in [3.818, 3.825]$ with optimal weight in the risky asset of $w* = 0.50$. While I do not question whether the risk aversion value around 3.8 is plausible or not, it is pretty clear that it is far lower than the value around 40 as it is pointed out as puzzling in the original study of Mehra and Prescott (1985). Furthermore, it is not so much higher than the estimate of risk aversion coefficient 3.22 in the experiments as presented in the studyBarsky, Juster, Kimball, and Shapiro (1997).

In Figure 4, I present the expected utility values of a portfolio with changing allocations in risky and riskfree asset for a CRRA coefficient value 3.55 function. Figure 4 shows that indeed a CRRA agent with $\alpha = 3.55$ attains the highest utility at the point where the allocation is around $50 - 50$. This result shows that the puzzlingly large premiums can actually be explained by a standard CRRA utility function with risk aversion coefficient around 3.55 in such an economic setting.

4 Possible Explanations

In the consumption based asset pricing models of type Rubinstein (1976), Lucas (1978), Breeden (1979b), Grossman and Shiller (1981) and Mehra and Prescott (1985), the inter-temporal consumption choice problem of an agent, when there is one risky and one riskfree asset in the economy, yields the first order condition as follows:

$$1 = \mathbb{E}_t \left[R_{t+1} \delta \frac{u'(C_{t+1})}{u'(C_t)} \right] \tag{4.1}$$

where C_t and C_{t+1} denotes the consumption allocation for time t and $t+1$ respectively. u is a concave utility function and R_{t+1} represents the gross rate of return of the risky asset and δ stands for the time preference coefficient. Rewriting the expression via using definition of covariance, we obtain:

$$\frac{\mathbb{E}_t [R_{t+1}]}{R_f} = 1 - \mathbb{C}OV_t \left(R_{t+1}, \delta \frac{u'(C_{t+1})}{u'(C_t)} \right) \tag{4.2}$$

where $\mathbb{E}_t \left[\delta \frac{u'(C_{t+1})}{u'(C_t)} \right] = 1/R_f$ in equilibrium. To follow the literature on the equity premium puzzle, I consider u as a CRRA utility function as $u(C) = C^{1-\alpha}/(1-\alpha)$. This reduces the marginal rate of substitution in to a ratio $\frac{u'(C_{t+1})}{u'(C_t)} = (C_{t+1}/C_t)^{-\alpha}$. Moreover, to obtain the closed form expression, I assume that assets and consumptions are jointly lognormally distributed (Hansen and Singleton, 1983). Rewriting Equation 4.2 in log terms as $r_t = \log(R_t)$ and $c_t = \log(C_t)$, I obtain

$$\mathbb{E}_t [r_{t+1} - r_f] = 1 - \alpha \mathbb{C}OV_t (r_{t+1}, (c_{t+1} - c_t)) \tag{4.3}$$

where $\delta \frac{u'(C_{t+1})}{u'(C_t)} = \log(\delta) - \alpha(c_{t+1} - c_t)$. In this case, in the asset pricing formula the marginal rate of substitution becomes also a random variable because of consumption. Thus, the covariance between excess stock returns and consumption growth is priced in relation to risk aversion coefficient α as illustrated in Equation 4.3. Calibrating this asset pricing equation, one realizes that the smoothness of the consumption data results in very low variance of consumption growth and very low covariance between returns and consumption growth. This low value leads the model to require unrealistically high risk aversion coefficient to match the first moment estimate of equity returns historically. Indeed Mehra and Prescott (1985) show that in order to rationalize the historical equity premiums, the (representative) CRRA utility function has to have a risk aversion coefficient at least around $40 - 50$.

Comparing the literature of the equity premium puzzle with the explanation of Benartzi and Thaler (1995), one immediately can notice the difference in the assumptions of the economy. In the *Myopic Loss Aversion* explanation, there is no consumption in the optimization problem of the agent. The representative agent only maximizes the prospective value of his value of portfolio by allocating his wealth in equity and riskfree asset. A similar setting has been addressed with conventional risk preferences in portfolio context (Merton, 1969) or general asset pricing context (St-Amour, 2005).

I now recall the portfolio choice problem of Merton (1969) as a theoretical argument to support my findings. Merton (1969) studies the portfolio choice problem of a CRRA agent over one risky and one riskfree asset. Important assumptions of the study are actually very helpful for my result as they lead to a very similar economic modeling to the analysis of the present study. In the model, the agent does not have any other income nor other risk sources. Hence, there is no consumption risk, nor consumption process, the agents' utility function consumes solely out of the agent's financial wealth. In this case, the resulting portfolio choice function for risky asset can neatly be expressed as follows

$$w = \frac{1}{\alpha}\frac{\mathbb{E}(R) - R_f}{Var(R)}. \tag{4.4}$$

The functional form can be solved to compute the required risk aversion value to have 50% of allocation of risky asset given the empirical estimates of the moments of the risky and riskfree asset returns. As presented in Table I, the historical equity premium is observed to be around 0.0835 with 0.20 volatility. For a 50% weigh in the risky asset, the risk aversion of the agent should be around $3.90 - 4$. One should note that Merton (1969) imposes distributional assumptions on the returns which may cause differences relative to the results I obtain by following the numerical calibration method in this study. Despite the minor differences in assumptions, the required risk aversion value of $3.90 - 4$ for the optimal weight to be 50% provides stronger evidence for the validity of my result. The risk aversion value of around $3.90 - 4$ seems very much in line with the results which I obtain by numerical calibration. Similarly, Equation 4.4 implies that the total wealth optimally is invested in the risky asset when the agent has a risk aversion value of around 2 given the historical return moments of the risky and riskfree asset. This result is also implied by the numerical results. Figure 3 shows that for any risk aversion values up to approximately $\alpha = 2$, the agent optimally invests 100% in the risky asset.

The framework of Merton (1969) isolates the consumption effects from the wealth and portfolio allocation problem. The assumed utility function is treated as if it were a utility for financial wealth. There is no risk caused by income or exogenous shocks to consumption modeled explicitly and hence the correlations of asset payoffs to consumption are not priced. However as Mehra and Prescott (1985) shows, that equity premium puzzle arises in an economy where consumption also follows a stochastic process and covariance between the asset payoffs. In such economic setting, consumption risk and its association to asset payoffs are the main sources of risk that determines the prices of the assets. In the calibration of such models, the issue is that the consumption data is too smooth and this leads to the covariance term's estimate to be too low to explain the large equity premiums with reasonable risk aversion coefficient values. By discarding the consumption risk, the puzzling nature of equity premiums already disappears. Hence any utility function can seem as if they potentially help to explain the large equity premiums.

In this study, I show that *Myopic Loss Aversion* is not necessarily a valid explanation for the equity premium puzzle. The explanation seems to be helpful simply because the prospect theory and the methodology used intrinsically does not contain the equity premium puzzle. Prospect theory is defined on the changes in financial wealth directly and consumption modeling with prospect theory is naturally absent in the the decision models of Kahneman and Tversky (1979, 1992). Hence, the approach of neglecting the consumption risk seems to be the core of *Myopic Loss Aversion* explanation of the equity premium puzzle. My results validate the findings that isolation of consumption and portfolio decisions may naturally explain the puzzling nature of returns with reasonable risk aversion coefficients (see, e.g. St-Amour, 2005).

5 Conclusion

In the present study, I question *Myopic Loss Aversion* as a possible explanation for the equity premium puzzle (put forward by Benartzi and Thaler, 1995). I first confirm their results by employing a more recent data. Then, I analyze to which extent explaining the equity premium puzzle can be attributed to prospect theory, i.e. as the title suggests, from *Myopic Loss Aversion.* By making the same assumptions and following their methodology, I examine the impacts of choosing a concave utility function, more precisely a CRRA utility function, instead of a prospect theory utility function. Moreover, I make parametric inferences on the required risk aversion values for a CRRA agent to find the risky and riskfree asset equally attractive. I find that a CRRA agent with a risk aversion coefficient of around 3.55 can also explain the large returns of a risky asset relative to those of a riskfree asset. This shows that prospect theory is not necessarily the core of the explanation for the equity premium puzzle.

After ignoring consumption risk and income effects, it seems that the puzzling nature of equity premiums does not arise at all. One can explain the premiums with reasonable risk aversion values independently of any particular choice of utility function as long as the utility function has some concave regions with sufficient curvature. Any potential explanation of the equity premium puzzle should not neglect consumption dynamics in the economy and try to explain asset returns by taking the smoothness of consumption into account.

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Part III

Appendix

Curriculum Vitae

Personal details

Nationality: Turkish
Date of birth: 04.08.1981

Education

September 2008- October 2014	**Ph.D. Studies in Banking and Finance** at the University of Zurich, Swiss Finance Institute Title of dissertation: *Essays in Asset Pricing Anomalies* Supervisor: Prof. Dr. Thorsten Hens, Chair of Financial Economics Committee: Prof. Dr. Thorsten Hens, Prof. Dr. Jens Jackwerth Defense date: 16 September 2014 Graduated Magna cum Laude
June 2010- July 2010	**Visiting Ph.D. Studies** at Stanford University (Department of Economics).
September 2007- September 2008	**Ph.D. Studies in Financial Mathematics** at Graduate School of Applied Mathematics Middle East Technical University, Ankara, Turkey.
September 2004- September 2007	**MSc. Studies in Financial Mathematics** at Graduate School of Applied Mathematics Middle East Technical University, Ankara, Turkey. Thesis: *Asset Pricing Models: Stochastic Volatility and* Information-Based Approaches
September 1999- March 2004	**B.Sc. Studies in Statistics** at Kirikkale University, Turkey Graduated Summa cum Laude (Ranked 1^{st} in the Department of Statistics)

Professional Experience

Research Assistant in the Chair of Financial Economics Prof. Dr. Thorsten Hens from 2009 to 2014 with awards of SFI Best Discussant 2009 and ACATIS Value Prize for the best dissertation piece (1st Prize).

Lecturer for Introduction to Matlab with Applications in Finance for the Masters of Banking and Finance and Quantitative Finance at University of Zurich/ the ETH in 2012(Fall), 2013(Spring and Fall) and 2014(Fall).

Lecturer for Exercises Advanced Financial Economics for the Masters of Banking and Finance and Quantitative Finance at University of Zurich/ the ETH in 5 sequential years from 2009 to 2013.

Teaching Assistant for Economic Foundations for Finance for the Masters of Banking and Finance and Quantitative Finance at University of Zurich/ the ETH in 2009, 2010 and 2011.